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UNITED STATES ARMED FORCES MEDICAL JOURNAL

*Published Monthly by
the Armed Forces Medical Publication Agency
Department of Defense*



ROBERT J BENFORD *Colonel USAF (MC) Ed to*
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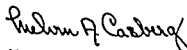
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Monthly Message

Current methods of procurement of career officers in the fields of medicine dentistry and nursing are not sufficiently productive both to replace those lost by attrition and to meet military requirements for regular officers. As a result there are not enough regular officers in the military departments to insure that the military medical and nursing missions are accomplished. Because of this numerical insufficiency in the regular corps extensive studies have been made on the feasibility of providing scholarships for students in medical dental, and nursing schools. This has evolved into a proposed scholarship plan which is to be included as part of the legislative program of the Department of Defense.

The proposed legislation provides that the selection of students for participation in this program will be made from among those who have been accepted for admission to these schools. Their tuition fees will be paid and each will also receive a monthly allowance to cover part of his personal expenses incident to school attendance. Each student will be obligated to serve one calendar year on active duty in one of the military departments in return for each academic year of his scholarship. The proposed plan also provides for methods of release of participants.

Upon Congressional approval of this program it is tentatively proposed to offer sufficient scholarships to provide approximately 300 graduates from schools of medicine 125 graduates from schools of dentistry and 285 graduates from schools of nursing at the end of the second year of operation of the plan and the same number of graduates each succeeding year. I believe that this plan will provide a sufficient number of officers to build up the hard core career service for the medical and health professional groups.



MELVIN A. CASBERG M.D.
Assistant Secretary of Defense
(Health and Medical)

MILITARY MEDICINE IN KOREA

MAJOR GENERAL GEORGE E ARMSTRONG

Surgeon General U S Army

I am deeply appreciative of the opportunity to discuss some of the medical strides that were made during the fighting in Korea. Unification had its severest test in Korea. The undeniable victory of military medicine was not an Army victory, but rather a victory of the Army, Navy, and Air Force, all linked together in a magnificently effective medical team. Death and disease were our principal enemies and if we examine the records, there is absolutely no doubt that the results of our unified medical effort were little short of amazing.

First of all, were we to have had our choice of an area in which to fight a war, it would not have been Korea. When the Army was committed to action in June 1950, we faced the job ahead with no little apprehension, and justly so, because there is hardly another spot in the world where similar hot and dry summers are followed by such bitter cold winters. Coupled with the weather and climate, which always seemed to work against us, was the rough terrain, and a myriad of infectious diseases endemic to Korea. As the fighting progressed, the problem was further complicated by the thousands of refugees who jammed roads and served as a mobile source for the spread of infection and disease.

As we looked back on the proud medical record of World War II, we fully anticipated an increase in incidence and mortality from disease. Such was not the case. Although we had roughly eight times as many admissions for disease as for battle injuries and wounds, we succeeded in reducing the admission rate considerably below that for World Wars I and II. During World War I, for example, admissions were 852 per 1,000 strength per year. This was reduced to 588 in World War II, and was further reduced to 468 during the Korean conflict.

During the entire campaign, the troops did not suffer a serious epidemic of any kind. Some may say we were simply fortunate, perhaps we were, but much progress was made in infectious disease control, environmental sanitation, occupational health,

Presented at the Fourth Annual Military-Medico-Dental Symposium, U S Naval Hospital Philadelphia Pa. 19 October 1953

and medical intelligence programs. We accelerated our aggressive preventive medicine campaign which was intended to halt the spread of disease and indoctrinate the individual soldier with a deep sense of personal responsibility for his own physical welfare. To assure continued use of approved sanitary measures, regular medical inspections—especially in rearward areas—were emphasized. Water points were carefully supervised. Immunization and vaccination methods were stringently adhered to and disease control programs were maintained. The subsequent decline of disease rates gives a direct indication of the permanent value of these programs.

Probably the brightest spot in our chapter of disease experience was in the prevention and cure of malaria. Malaria has been of the most serious import in every war in which our country has been involved. Korea with its mosquito-ridden rice paddies was no exception. Because of our most active research and development program following World War II, we were able to supplant quinacrine hydrochloride with the newly developed chloroquine as a malaria suppressant. The soldier liked it because he only had to take chloroquine once a week and he never experienced the toxic symptoms produced by quinacrine. We liked it because it was effective against malaria in the clinical stage. Meanwhile research on a cure for malaria was going forward and in the summer of 1951 primaquine, which had been developed under the joint sponsorship of our Medical Research and Development Board and the Public Health Service, appeared to be the best weapon against malaria in the tissue stage. In December 1951 we began routine administration of primaquine daily for two weeks to troops returning to the United States by ship. The very low rate of recurrence among these returnees bears out the fact that in the combined chloroquine-primaquine therapy at last we have a cure for Korean vivax malaria.

ACUTE HEMORRHAGIC FEVER

The disease condition in Korea has not been entirely rosy, however. Early in 1951 our physicians were faced with a disease virtually unknown to western medicine—acute hemorrhagic fever. As soon as possible we established a specialized treatment center in one of our evacuation hospitals and undertook a three-way effort to identify the vector, isolate the causative agent, and discover a specific treatment. Initially the fatality rate from the disease was in excess of 10 percent, but our scanty knowledge of the disease grew, and with the aid of an artificial kidney installed in our treatment center, the rate was cut to less than five percent. There is still much that we do not know about the disease so our research continues. To the best

of our knowledge the reservoir of infection is a species of rodent found in Korea, Manchuria, and Far Eastern Siberia

Infectious hepatitis also has presented a serious problem to military medicine because of the long hospitalization required for the disease. Following World War II, our occupation forces experienced an outbreak of hepatitis, and we anticipated a similar serious problem among fighting troops in Korea. Peak incidence for the entire combat period, however, was less than 35 cases per thousand average strength per year which occurred in February 1951. The rate steadily declined from that point and indicates that we have made some improvements in diagnosis, nutrition, and clinical management but specific curative treatment and method for prevention still remain as major problems.

WOUNDS AND BATTLE INJURIES

Our troops were not only fighting the enemy, but also had to contend with severe weather as well as a rugged mountainous terrain that constituted an ever present barrier to good transportation. Shortly after the offensive that brought our troops to the Yalu River in September 1950, our admission rate for battle injuries and wounds climbed to a high of 1 187 per thousand average strength per year. The rate fluctuated a great deal during the hostilities and reached a low of 22 for March 1952. At no time did the death rate of the wounded exceed the 4.5 percent record for World War II but fell to an all time low of 2.3 percent for the entire Korean campaign. Considering the total number of men wounded in action in Korea, this means that there are about 2 000 soldiers living today who owe their lives to the increased effectiveness in the treatment of battle wounded. Along with this favorable picture, our efforts to return the wounded to duty have also been well rewarded. In World War II, we managed to return 77 out of every 100 wounded to duty. Although final figures for the Korean conflict are not available, it appears that the ultimate proportion will be in the neighborhood of 85 percent. Thus, attrition of our most valuable asset, manpower has been further minimized.

Since the signing of the truce we have had a little time to reflect on some of the factors that influenced our success in Korea. It is difficult to list them in order of their importance, or even to list them all. It was particularly fortunate that the many lessons learned in World War II were still fresh in our minds and that we could call on all types of key personnel who, just a few years before, had learned those lessons so well.

Our postwar graduate medical education programs also yielded untold benefits. In 1947 we had a total of 196 board-certified specialists in the Medical Corps of the Regular

Navy and Air Force Shortly after hostilities broke out that list had grown to almost 450 In the first critical days of the fighting those specialists assigned to key operational positions together with the resident physicians who were taken out of hospital training played a vital role in establishing our medical program keyed to combat activity

SUPPORT BY NAVAL RESERVE OFFICERS

Strong support to the total effort in Korea was given by the 570 young medical officers of the Naval Reserve who were assigned to the Army in the difficult early days of the conflict. Both as physicians and officers they were an exceptional group Their transition from Navy to Army procedures was accomplished with very little difficulty and they soon won the wholehearted plaudits of both line and medical officers wherever they served Their return to the Navy the following year was accomplished conscientiously but regretfully

When American forces were compressed into the Pusan perimeter we came to realize the invaluable service given by the floating hospitals of the Navy Each time I visited the combat area I was highly impressed with the fine professional work they were doing

The fact that combat activity was confined to a relatively small area gave us an unusual opportunity to concentrate on all phases of medical care and treatment We had complete control of the air and sea between the combat zone and Japan and from Japan to the United States Our medical supply system functioned like clockwork and from the beginning provided ample quantities of all supplies including whole blood and the latest antibiotics neither of which was available early in World War II

The mobile Army surgical hospitals and the Navy medical surgical teams performed gallantly in providing definitive surgical treatment closer to the front line than ever before

The helicopters operated by the Air Force and the Marine Corps were quick to earn the respect and affection of both the soldier and the medic as an indispensable means of evacuation During the Korean fighting the helicopters and the conventional fixed-wing planes evacuated over 80 000 wounded from the combat area As a result it was decided that the Army Medical Service should include the helicopter ambulance unit as an integral part of its field organization

The incomplete list of factors that I have just related is by no means cause for complacency On the contrary it indicates that there is always room for increased knowledge better tech-

nics, and more technical developments I do not believe that we can have an effective medical program without realistic, forward looking research and development

RESEARCH AND DEVELOPMENT

During the Korean campaign, research and development not only continued but was conducted in the combat zone to an extent never before realized possible Several teams were sent into the area to find the answers to difficult questions of medical importance

One of the first such problems was that of cold injury The first patients with cold injuries were reported in November 1950, when the Eighth Army pushed the enemy back to the Manchurian border As soon as the Chinese communists entered the war and forced the withdrawal from North Korea, cold injury rates ballooned Troops fought and lived in temperatures as low as 25 degrees below zero Entire units were cut off and pinned down by enemy action, and exposure, loss of clothing and equipment, and lack of hot meals took their toll

A cold weather indoctrination program that reached every soldier helped start the steady decline of cold injury rate A team was dispatched to study the problem, live with the men, ask questions, make observations, and get some of the answers The team returned to the United States and set down some 29 conclusions and 14 recommendations—some of which were adopted It also recommended more than a dozen areas in which further study is needed We shall continue to study the problem

Meanwhile, it became apparent that the fatality rate had reached a new and probably irreducible low level, but the same reduction in the death rates had not extended to the battle field In an effort to determine whether there was any chance of reducing the number of battlefield deaths, a team was sent to Korea to make a missile casualty survey They studied 4,600 cases of "killed in action" and "wounded in action" The data from that study revealed that a lightweight armor would probably reduce deaths among troops exposed to the enemy The team joined forces with other elements of the Army and with the medical department of the Navy, and devised the eight-pound nylon armored vest Follow up studies of the prototype revealed these amazing results

1 Two thirds of all missiles hitting the armor, three quarters of all fragments which account for most of the wounds and only one fourth of all small arms missiles were stopped

2 The vest reduced the incidence of chest and upper abdominal wounds by about two thirds and about one fourth of the chest and upper abdominal wounds sustained by soldiers wearing the vest were reduced in severity

3 The vest was acceptable to most of the soldiers who wore it in combat. Work is now under way to further perfect the vest and to produce an acceptable pair of shorts that will give the same degree of protection to the hips buttocks and groin. These developments will not lighten the burden of the field surgeon but fewer of his casualties will die on the battlefield

SURGICAL RESEARCH TEAM

In January 1952 a surgical research team sent to Korea concentrated at one of the forward mobile Army surgical hospitals and also established a renal research center at an evacuation hospital. The team found that most wounded men who reached the medical evacuation chain were effectively managed and recovered with low morbidity and minimal crippling compatible with their wounds. The havoc resulting from hemorrhage and infection has been reduced almost to the vanishing point by the sum total of surgical care. Of these wounded from 25 to 4 percent will die and of these almost one half die as a result

direct injury to a major organ. It is to the remaining group of from 1 to 3 percent of the total wounded that surgical research has been directed. These men sustain major multiple wounds not fatal per se but fatal because of their remote consequences. We firmly believe that major investigative and therapeutic effort is justified to save these lives even though it is a statistically minor group of the wounded.

One of the bright chapters in military surgery and interservice co-operation was written in the field of vascular surgery. At the same time that Navy surgeons were making progress in vascular surgery the Army was fortunate to have an Air Force surgeon head its program and report outstanding successes. In the Eighth Army alone almost 300 repairs of peripheral arteries were performed and success was attained in about 80 percent of the patients as compared with 81 arterial repairs and success in 50 percent during World War II.

Notable progress was also made in other fields such as in the treatment of shock, wound débridement and closure, control of infections, blood replacement problems, stress plasma volume expanders, lower nephron nephrosis and a host of others.

Research on these and many others all add up to three important factors that transect all lines of our endeavors toward providing a better medical service for the troops. (1) The fruits

of such research improve the level of medical care in the combat zone (2) The teaching aspects not only develop new concepts and methods, but have a very favorable effect on medical officer morale (3) Such research provides the most severe testing ground for new devices, drugs and techniques.

Though my account has been somewhat superficial, I have attempted in the time available to give at least some of the highlights of three years in Korea. I sincerely hope as you do that the hostilities in Korea have been permanently terminated. In peace or in war, however, we will continue not only to provide an effective medical service but will strive constantly to improve our service by taking advantage of every possible opportunity

Patient Co-operation in Heart Disease

One of the most vital of all the factors in prognosis of heart disease is the co-operation of the patient himself. He should have enough understanding of his condition and of the treatment, including even the minute details thereof and enough confidence in his physician to follow his recommendations wholeheartedly. The difference between life and death may easily depend on this factor. That is why it is so essential for the physician to establish at the very beginning a good relationship and to take time to explain as fully as necessary what is wrong and what should be done without going into tedious detail or recounting all the bad complications that could develop. An hour spent thus may save weeks and months of miserable apprehension and unhappy recollection. I cannot over-emphasize the value of this relatively simple measure that can so vitally affect both prognosis and treatment. Also it saves the time and energy of the patient who not learning enough from his physician, suspiciously or even openly resorts to medical or quack literature. If inadequately informed, the patient may "shop around" until he finds a physician or clinic to give him advice to suit his fancy.

—PAUL D. WHITE, M.D.

in *Journal of the American Medical Association*, p. 74 Sept. 12, 1953

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VASCULAR SURGERY AT WALTER REED ARMY HOSPITAL

I Introduction

SAM F SEELEY Brigadier General MC USA

IN the summer of 1949 a program was initiated for the development of vascular surgery on the neurosurgical thoracic and general surgical sections of the surgical service. Experience gained in World War II and the availability of adequate quantities of whole blood and expert anesthesiologists made it worthwhile to develop a center for the treatment of vascular lesions in members and dependents of the Army and Air Force. In the fall of 1949 a blood vessel bank was developed and early in 1950 Walter Reed Army Hospital was designated as a surgical center for vascular lesions.

The heart the pericardium the major arteries the veins of the portal system and even a few major vessels within the skull are now operated on when proper indications arise. Some surgical procedures within and through the thorax have been well established the combined thoracoabdominal approach where indicated is employed without significant increase in the hazard to the patient. In general preserved blood vessels are used as grafts in the correction of obliterations aneurysm coarctation of the aorta and lesions of the other large arteries. In most peripheral vascular lesions sections of autogenous saphenous or cephalic veins are used for grafts.

Vascular conditions requiring surgery are congenital or acquired. Among the congenital lesions are the intracranial arterial aneurysms anomalies of the heart and great vessels multiple congenital arteriovenous fistulas of the extremities congenital phlebectasia and vascular nevi. Acquired lesions include those produced by wounds such as false aneurysms and arteriovenous fistulas those resulting from infections, such as mitral valvular lesions and those due to hepatic cirrhosis the most frequent cause of portal hypertension.

Vascular war wounds fall into three major categories acute intermediate and chronic. Based on the experience gained in the definitive surgery of arteriovenous fistulas and false aneurysms

members of our staff, stationed in Korea, have demonstrated that re establishment of the continuity of major arteries a few hours after wounding is feasible and materially decreases the percentage of amputations due to vascular insufficiency. Expanding false aneurysms, because of threatened rupture or pressure upon major nerve trunks, require immediate operation.

The following four articles deal with our experiences in vascular surgery from July 1949 to May 1953. Among these are included such rare conditions as congenital phlebectasia of the internal and external jugular veins, multiple congenital arteriovenous fistulas of the extremities and lungs, segmental arterial occlusion, and abdominal aortic aneurysms.

Proficiency gained by the residents and staff in vascular surgery at this center will prove invaluable to the armed services in the years to come. Training and experience in boldness of exposure, prevention of hemorrhage, and meticulous technic will serve to qualify surgeons in the art of operating on the vascular system. It will develop confidence in the performance of other major surgical procedures. It will stimulate professional advancement by the knowledge that the repair of great vessels damaged during operation, or by trauma, or involved by neoplastic growth will be dealt with successfully.

Finally, the referral of patients with complicated vascular conditions to this center gives additional service to the staffs of all hospitals throughout the Army and Air Force.

II Cerebral Aneurysms Arteriovenous Anomalies and Carotid Artery Cavernous Sinus Fistulas

GEORGE J HAYES *Lieutenant Colonel MC USA*

HARRY F STEELMAN *Captain MC USAR*

IMPROVEMENT in technical aids available to the neurosurgeon has lowered the operative mortality of patients with vascular intracranial lesions to the level of that for other major brain lesions. Furthermore, hemorrhage from intracranial vascular lesions carries a risk to life of about 50 percent and a risk of serious neurologic disability almost as great. It is imperative, therefore, that patients suspected of having one of these conditions be given the benefit of neurosurgical evaluation.

During the years 1946 through 1952, 62 patients were treated for intracranial vascular lesions by various members of the neurosurgical staff of this hospital. The size and location of

the lesion was determined by history, neurologic signs arteriography electroencephalography and occasionally by pneumoencephalography. These vascular lesions have been classified in three groups (1) saccular or berry aneurysms of the circle of Willis (2) congenital arteriovenous anomalies or varices of the brain and (3) acquired arteriovenous fistulas of the internal carotid artery and the cavernous sinus.

ANEURYSMS

The largest number of patients (40) had a saccular aneurysm manifested by subarachnoid hemorrhage or the sudden development of focal neurologic signs. Because the mortality is so high due to the initial or subsequent hemorrhage from such a lesion an operation should be considered. Each patient must be evaluated on an individual basis and the particular operative procedure that will secure maximal results with minimal risk should be adopted.

When preliminary compression of the artery is tolerated for 30 minutes without producing neurologic signs aneurysms of the internal carotid artery below its bifurcation should be treated by initial ligation of the artery in the neck. If the patient's age and general condition permit the neck ligation should be followed by placing clips on the intracranial portion of the internal carotid artery thus trapping the lesion between clips and ligation and isolating it from the circulation. Those aneurysms located on the anterior communicating artery should not be operated on because the risk to the patient is as great or greater than if the lesion were left alone.

Middle cerebral artery aneurysms on the dominant hemisphere should be treated by ligation of the carotid artery in the neck. If the aneurysm is on the nondominant hemisphere and has a neck to which a clip can be applied intracranial approach should be done.

An aneurysm in the posterior fossa should be exposed and clips applied if it is located on an artery which can be sacrificed with safety. Otherwise only packing with muscle is justified. Ligation of the vertebral artery is not advised.

The results of surgical treatment are tabulated to show the operative procedures used and the risk of hemiplegia and death (table 1). Five patients had a ligation of the carotid artery in the neck as the only treatment; there were no deaths and one hemiplegia. Thirty-five patients had an intracranial operation with two deaths and three hemiplegias. Of the 35 patients 16 had a combined intracranial approach and ligation in the neck with one death and two hemiplegias.

TABLE 1 *Results with intracranial aneurysms*

Treatment	Cases	Hemiplegia	Deaths
Occlusion neck of aneurysmal sac			
With removal of aneurysm	3	0	0
Without removal of aneurysm	5	0	0
Trapping carotid artery between intra cranial clip and ligation in neck	16	2	1
Trapping aneurysm between intra cranial clips	10	1	1
Packing aneurysm with muscle	1	0	0
Intracranial operations of all types	35	3	2
Ligation of carotid artery in neck only	5	1	0
Total	40	4	2

Of the 40 patients with aneurysms treated surgically, there were two deaths and four hemiplegias. All patients surviving operation are alive and have had no recurrence of symptoms or signs.

CONGENITAL ARTERIOVENOUS ANOMALIES

These lesions grow progressively until their presence is evidenced by recurrent epileptic seizures or subarachnoid hemorrhage.

TABLE 2 *Arteriovenous anomalies*

Treatment	Number	Deaths	Sequela due to operation	Improved
Excision	6	1	0	4
Decompression	2	0	0	0
No surgery	8	0	0	0
Total	16	1	0	4

Operative excision of these lesions is a formidable task accompanied by high morbidity and mortality in unselected cases. Furthermore, the risk to the patient's life from repeated hemorrhage is much smaller than that in patients with saccular aneurysms. These factors mitigate against surgical operation except when one or more of the following conditions are present:

(1) uncontrollable epileptic seizures (2) history of two or more subarachnoid hemorrhages (3) presence of intracerebral hematoma as evidenced by shift of blood vessels in the arteriogram and (4) location of the lesion in a place where excision can be done without producing hemiplegia or aphasia

Röntgen ray therapy is not advised. Ligation of the carotid artery in the neck is seldom indicated because collateral circulation will quickly develop in the lesion from the circle of Willis. The results obtained by operation on 16 patients with arteriovenous anomalies are shown in table 2

CAROTID ARTERY CAVERNOUS SINUS FISTULAS

This condition is usually caused by nonpenetrating trauma to the head with or without fracture of the bones in the region of the cavernous sinus. This arteriovenous mass becomes progressively larger producing a machinery like bruit, pulsating exophthalmos, ocular palsies, and loss of vision in the affected eye. If untreated the lesion becomes larger with increasing neurologic deficit and eventual death by rupture.

Initial treatment requires ligation of the internal carotid artery in the neck. If the fistula persists the internal carotid artery within the cranium should be exposed and clips applied thus trapping the lesion between the ligature in the neck and the intracranial clips.

A total of six patients with this lesion have been operated on and cured. All patients required intracranial applications of clips after ligation of the internal carotid artery in the neck. There were no postoperative deaths or hemiplegias. One patient died two years after operation from rupture of a berry aneurysm on the opposite carotid artery.

SUMMARY

Sixty-two patients with various types of intracranial vascular lesions have been operated on in this series. In 40 patients with saccular aneurysms of the circle of Willis there was a mortality rate of 5 percent and a hemiplegic morbidity of 10 percent. In eight patients with arteriovenous anomalies of the brain there was 13 percent mortality and no hemiplegic morbidity. Six patients with carotid artery cavernous sinus fistulas were treated by ligation of the internal carotid artery in the neck followed by applying clips to the intracranial carotid artery with no operative mortality or morbidity.

III Vascular Lesions of the Heart, Pericardium and Thoracic Aorta

JOHN S. PAUL, *Lieutenant Colonel, MC, USA*

SANFORD W. FRENCH III *Colonel, MC, USA*

THE thoracic surgical section of this hospital has participated in the cardiovascular surgery program since 1950. From a meager beginning, the program has consistently advanced to include more and more vascular defects which are either correctable or improved by surgical means. Some of these include the treatment of (1) patent ductus arteriosus, (2) coarctation of the aorta, (3) certain congenital and acquired cardiac defects, (4) constrictive pericarditis, (5) reparable cardiac injuries, and (6) pulmonary arteriovenous fistulas.

In order to properly treat the above-mentioned conditions a cardiac catheterization laboratory, under the cardiology section and an arterial bank were established.

The number of patients with any particular condition has not been large with the possible exception of those with a patent ductus arteriosus, but there has been considerable variety. All patients with vascular defects are systematically examined preparatory to a joint session attended by cardiologists and surgeons. Table 3 shows the number and variety of operations done.

LIGATION OF PATENT DUCTUS ARTERIOSUS

Fifty-two patients with a patent ductus arteriosus were operated on. The majority of these patients were children and simple ligation and suture ligation after the method of Blalock was carried out. Several cases in the older age group required division and suture of the ductus. The number of patients being operated on is steadily increasing. The mortality for this operation has been zero.

MITRAL COMMISSUROTOMY

Twenty-six mitral commissurotomy have been performed, two in 1951, 12 in 1952 and 12 in the first half of 1953. The mortality has been zero in those patients who had mitral commissurotomy. One patient died 70 days postoperatively of congestive heart failure and lung abscess. The patient's condition at the time of operation after the chest had been opened was so precarious that the heart was not opened. In retrospect the operation been carried out, even in spite of the then poor condition she might have survived. I had

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IV Traumatic Arteriovenous Fistulas and False Aneurysms

EDWARD J JAHVKE J M J MC USA

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DURING the past three and one half years 176 patients with 182 traumatic peripheral vascular lesions were treated at this hospital. All were the result of the Korean conflict. In addition many patients with thrombosis of the aortic bifurcation (Leriche syndrome) arteriosclerotic segmental occlusion of peripheral arteries abdominal aortic aneurysms phlebectasia of the jugular vein and congenital hemangiomas and arteriovenous fistulas have been treated. In the vast majority of these lesions major arterial continuity has been restored by anastomoses or grafting procedures. This presentation however will be limited to the surgical management of the 182 traumatic lesions resulting from war wounds.

TABLE 4 Distribution of traumatic peripheral vascular lesions

Loc	Number of fistulas	Number of false aneurysms	Total
Head and neck	14	3	17
Upper extremity	28	29	57
Lower extremity	80	28	108
Total	122	60	182

The arteriovenous fistulas accounted for 122 of the lesions and the remaining 60 lesions were false aneurysms. Six patients had two vascular injuries. The lesions have ranged in location from a fistula of the supra orbital vessels to an aneurysm of the deep plantar arch of the foot. Two thirds of the lesions have been in the lower extremities with the remaining one third in the head neck and upper extremities (table 4). Of the entire

group of lesions herein reported 38 were operated on in 1950, 81 in 1951, 38 in 1952, and 24 in the first half of 1953

Following the teachings of World War II, the lesions were managed initially by obliterative operation. Regardless of the artery involved, arteriovenous fistulas were treated by quadruple ligation or endoaneurysmorrhaphy and false aneurysms were treated by arterial ligation. In all instances, the lesion itself was excised. To utilize these methods, it was imperative that operation be delayed at least three months to allow optimal development of an adequate collateral circulation. Of 116 lesions involving major vessels, the first 28 were treated in this manner. Though no limbs or digits were lost post-operatively, nine of the patients had varying degrees of symptomatic arterial insufficiency. The adjunctive pre- or post-operative employment of lumbar sympathectomy had little effect in diminishing the symptoms of insufficiency.

Postoperative arterial inadequacy was only one of the problems encountered. Awaiting development of collateral circulation required prolonged hospitalization. Some patients had large aneurysms that caused discomfort, pain and continued concern that rupture and hemorrhage might occur. Some lesions enlarged and bled, while others exerted damaging pressure on contiguous nerves and other vital structures. Early reparative operation, eliminating the delay period for the development of collateral circulation, seemed to be the solution to these problems. Thus it was decided to re-establish vascular continuity in all major arteries by direct anastomosis. If this was not possible homologous artery or autogenous vein grafts would be employed as an alternative method of repair.

Direct end-to-end anastomosis or simple division of the fistula similar to a patent ductus, became the procedure of choice in most instances. Use of the latter method was limited to those patients in whom the fistulous tract was of narrow diameter. It could not be employed in aneurysms. In several patients simple transverse arterial suture was possible. Usually one or two centimeters of artery could be resected and still permit end-to-end apposition without excessive tension. Sixty-two major arteries were anastomosed or repaired without grafts, and only two subsequently became thrombosed. One of these occurred at the site of anastomosis following sustained spasm, the result of undue tension on the suture line. The second thrombosis followed transverse repair of an arterial laceration.

Homologous artery grafts were obtained from the hospital graft bank. Six such grafts have been used, one each in the subclavian, axillary, brachial, common iliac, common femoral,

TABLE 5 7 alment / patient with l ons mol 2 major earier

A ry	T l	AVF	FA	Typ l tm t					
				Lig	Di d d (ul tr	L t l p	A o- m	V l g l	As y g ft
Ca ld	7	7	0	1	2	0	3	0	0
S bcla i	6	5	1	2	0	1	2	0	1
A ill y	19	8	11	4	0	1	7	4	1
B h i l	17	8	9	5	1	1	8	1	1
illi	2	1	1	0	0	0	1	0	1
C nm f mor l	7	5	2	0	2	0	2	2	1
S p e f i l									
f m l	28	24	4	7	1	0	14	6	0
P pl i	30	20	10	9	2	1	13	3	1
T t l	116	78	38	28	8	4	50	16	6
AVF Ast l									
FA F l									

fi tul
ry m

and popliteal arteries. In every instance, excellent pulsations were present in the involved extremity following operation.

TABLE 6 Treatment of patients with lesions involving minor arteries

Artery	Total	AVF	FA	Type of treatment	
				Ligation	Anastomosis
Supraorbital	1	0	1	1	0
Superficial temporal	3	2	1	3	0
Vertebral	2	2	0	2	0
Internal carotid	1	1	0	1	0
Inferior thyroid	2	2	0	2	0
Thoracoacromial	2	2	0	2	0
Thoracodorsal	2	1	1	2	0
Posterior humeral circumflex	2	1	1	2	0
Profunda brachii	1	0	1	1	0
Radial	5	1	4	4	1
Ulnar	2	1	1	2	0
Volar interosseal	1	1	0	1	0
Common digital	1	0	1	1	0
Branch to sartorius muscle	1	0	1	1	0
Profunda femoris	7	7	0	7	0
Lateral femoral circumflex	2	1	1	2	0
Medial inferior genicular	3	2	1	3	0
Posterior tibial	11	9	2	11	0
Peroneal	9	8	1	9	0
Anterior tibial	5	2	3	5	0
Dorsalis pedis	1	0	1	1	0
Deep plantar arch	1	1	0	1	0
Total	65	44	21	64	1

AVF Arteriovenous fistula

FA Femoral artery anastomosis

In three follow-up has shown evidence of structural change. The graft in the subclavian artery underwent slow occlusion four months after insertion as evidenced by decreasing pulse volume and blood pressure in the involved extremity. Explor-

tion at a later date for concomitant nerve injury revealed the graft to be patent and functioning but surrounded by scar tissue. The graft in the axillary artery showed similar clinical evidence of change. It was minimal and manifested by a 10-millimeter drop in blood pressure in the affected arm. The graft in the common iliac artery ruptured on the thirtieth postoperative day because it had been partially suspended through a large aneurysmal sac and did not have adequate viable coverage.

Sixteen autogenous vein grafts obtained from the brachial, saphenous, superficial femoral, and popliteal veins were employed successfully in the axillary, brachial, common femoral, and popliteal arteries. Only one failure occurred in this group: a thrombosis developed following infection in the false sac which had been left in place adjacent to the graft. All other vein grafts remained patent and functioned adequately as demonstrated by arteriogram (table 5).

Utilizing these methods, 84 (75.9 percent) of 116 major vessel injuries have been operated on with re-establishment of arterial continuity. Postoperative symptomatic insufficiency occurred in three patients, all of whom had thrombosed repairs. This was an incidence of 3.5 percent as compared with 32.1 percent in patients treated by ligation. Since major arterial continuity is now restored in all patients, no operative delay is necessary for the development of collateral circulation. Patients with expanding or bleeding lesions or those with compressing nerves are operated on without delay. The ultimate result has been the restoration of functional limbs, the avoidance of major nerve damage, and the decrease of hospitalization time.

The treatment of arteriovenous fistulas and false aneurysms involving minor vessels has remained the same throughout the entire series of 66 such lesions, namely, ligation and extirpation. The adequacy of additional arteries in the forearm and leg made vascular repair in these areas inadvisable and totally unnecessary (table 6).

SUMMARY

In a series of 182 vascular injuries in Korean battle casualties, arteriovenous fistulas account for 122 of the lesions and false aneurysms for 60. The treatment of choice in minor vessel injuries is quadruple ligation or simple arterial ligation with excision of the associated fistula or aneurysm. The first 28 major vessel lesions were treated in a similar fashion. This resulted in symptomatic arterial insufficiency in nine (32.1 percent) of the patients. In the remaining 84 patients with major lesions, arterial continuity was re-established by anastomosis or transverse repair in 62, by homologous artery graft in six, and by autogenous vein graft in 16. Failure occurred in four

instances. Thrombosis occurred in one and torn the one that we repaired, and one vein graft rupture occurred in one arterial graft because of inadequate coverage. Follow up study has revealed symptomatic arterial insufficiency in only three patients (7.5 percent). Early restoration of arterial continuity is recommended in lesions involving major arteries if the greatest number of functional as well as viable limbs are to be obtained.

V. Portal Hypertension

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A comprehensive study of portal hypertension of both the intrahepatic and extrahepatic type has been established at this hospital. It is a joint project combining the resources of the hepatic and gastrointestinal sections of the medical service and the vascular section of the surgical service. After careful deliberation a standard procedure was established for preoperative evaluation, operative approach and long term postoperative follow up.

All patients had total and one minute serum bilirubin, thymol turbidity, zinc sulfate turbidity, cephalin cholesterol flocculation, sulfobromophthalein retention, prothrombin time, serum proteins, and occasionally Popper turbidity and cholinesterase determinations. The tests were repeated at biweekly intervals during the intensive preoperative medical management. Operation was delayed until the function studies indicated hepatic stability at the level of maximum improvement. They were then repeated daily for one week prior to operation to obtain a final base line. In the postoperative period, function studies were again repeated daily until they returned to the preoperative level or became stabilized at some other level.

An accurate evaluation of the degree of portal hypertension present was also made before, during, and after operation. Tests which would give direct objective evidence were used for the most part. These consisted of roentgenographic barium study of the esophagus, portal circulation time using the rectum-to-lung ether technic, esophagoscope examination with direct manometric measurement of the pressure in the esophageal varices, portal manometric pressure pre and post-shunt, infrared photography of the superficial abdominal veins, and percutaneous splenic portal venography in selected cases.

The surgical procedure of choice in all patients was the direct end-to-side portacaval shunt utilizing the thoracico-

abdominal approach. The splenorenal shunt was reserved for those patients in whom no adequate portal vein was available. Finally, in patients on whom no shunt could be established, less desirable procedures such as hepatic artery ligation or simple splenectomy were used. Patients seen during a bout of active hematemesis were treated conservatively by sponges taken intraesophageal balloon tamponade. If this was unsuccessful, transesophageal ligation of the esophageal varices was performed.

TABLE 7 Cases of portal hypertension in 36 patients

C	N m b e r	O p e r a t i o n		
		Porta a l h e p a t i c	Spl h e p a t i c	O t h e r
Intrahepatic block				
Laennec's cirrhosis	25	20	2	3
Postnecrotic cirrhosis	7	4	2	1
Biliary cirrhosis	1	1	0	0
Total	33	25	4	4
Extrahepatic block				
Bleeding esophagus	3	0	2	1
Total	3	0	2	1
Grand total	36	25	6	5

Thirty six patients with evidence of portal hypertension and esophageal varices were operated on (table 7). Thirty three of the patients had intrahepatic and three patients had extrahepatic blocks. Of those with intrahepatic block, 25 were due to Laennec's cirrhosis, seven to post necrotic cirrhosis, and one to biliary cirrhosis. Twenty seven of the patients had had hematemesis on one or more occasions. In one patient the bleeding was so severe that 76 pints of blood were required for stabilization.

Portal vein to inferior vena cava anastomoses were established in 25 patients using the end-to-side technique in 24 and the side-to-side technique in one. Six patients were treated by the end-to-side splenorenal shunt with preservation of the kidney. Four of the six had an intrahepatic block and were explored with the intent of doing a direct portacaval shunt, but the presence of excess varix formation in the hepatoduodenal

ligament made this impracticable. In other two patients having this disease one of unknown origin and one had a portal vein thrombosis following a pyelophlebitis secondary to an appendiceal and hepatic abscess.

One patient, who preoperatively required 76 parts of whole blood, was treated by ligation of the hepatic and splenic arteries at the celiac axis. The portal pressure dropped from 415 to 150 mm. of saline. He has had no further episodes of bleeding. However, over a 20-month postoperative period the pressure in the esophageal varices rose from 150 to 190 mm. of saline. This was within 30 mm. of his preoperative pressure. The result is considered a clinical failure because the patient still had tremendous varices with a markedly elevated pressure over the normal values of 80 to 120 mm. of saline.

A splenectomy alone was performed in two patients on whom no shunt was feasible because of cavernomatous changes in the portal vein and extremely friable varicosities of the splenic vein. Hepatic artery ligation was not considered in these patients because of the unsatisfactory results obtained in the previously described patient.

A splenectomy alone was also performed on a 10-month-old child with portal vein thrombosis because the size of the splenic and renal veins made an adequate splenorenal shunt impossible. The final patient was explored for a portacaval shunt which was technically not possible. He is now awaiting re-exploration for a possible splenorenal shunt.

RESULTS

Effects on liver function Comparison of preoperative with postoperative liver function demonstrated several significant facts. There is a definite increase in hepatic dysfunction following operation. This lasts from about seven to 10 days and then remains essentially at the preoperative level. The amount of alteration observed varies with each patient but seems to correlate with the extent of anesthetic and operative trauma. Patients on whom operation required from two to three hours show only mild liver depression which lasts about four or five days. If the operation requires from five to six hours the hepatic function is markedly depressed and may require a month to return to the preshunt level. Little correlation has been found between the degree of liver impairment prior to operation and the severity and period of additional dysfunction encountered after shunt. The use of intravenous aureomycin for three days postshunt has also been found to decrease the liver dysfunction in both good and poor risk patients.

On the basis of these findings no patient has been refused operation regardless of the severity of liver disease as long as preoperative study indicated stabilization of the disease process

Effect on portal hypertension At operation the measured portal pressures ranged between 300 and 550 mm of saline in all but one patient. After establishment of the shunts, which varied from 1.5 to 2.5 cm in diameter there was a marked lowering of the portal pressure. In 80 percent of patients the drop was over 200 mm of saline. In no patient was the final postshunt pressure over 280 mm of saline. Thus all final readings were below 300 mm of saline, below which postoperative hemorrhage is unlikely.

The changes noted in the portal circulation time also indicated effective portal decompression. Before shunt the time ranged from 26 to 68 seconds, well above 25 which is the upper limit of normal. Repeat portal circulation time at frequent intervals after operation has been between 13 and 25 seconds. Since the portal circulation time is proportionate to the degree of portal hypertension the results would again indicate the adequacy of the shunt.

TABLE 8 Post operative mortality 36 patients

Type of patient	Number of patients	Length of follow-up	Mortality (percent)
Extrahepatic block			
Splenorenal shunt	2	0	0
Other	1	0	0
Total	3	0	0
Intrahepatic block			
Portacaval shunt	25	2	8
Splenorenal shunt	4	0	0
Other	4	0	0
Total	33	2	6.1
Grand total	36	2	5.5

Another important indication of effectiveness of operation was seen on esophagoscopy examination. In 60 percent of patients all varices disappeared following the shunt. In 20 percent collapsed veins were seen but no pressure could be obtained. In the final 20 percent varices were present but

varices with decreased pressure were found at postoperative esophagoscopy examination. One patient had a portacaval shunt four months prior to the hemorrhage. At that time the esophageal varix pressure was 210 mm of saline. The second patient had a splenorenal shunt performed six months before the bleeding episode. At that time the esophageal varix pressure was 274 mm of saline. Hemorrhage was not anticipated in either case because the postshunt pressure was below the 300 mm critical level. It is encouraging however that they have gone two years without subsequent bleeding. This would indicate that factors other than portal hypertension may be partly responsible for hematemesis.

SUMMARY

In a study of 36 patients with portal hypertension, the direct portacaval shunt is considered the treatment of choice and was employed in 25 patients. A splenorenal shunt was necessary in six patients and five required less desirable procedures such as hepatic artery ligation and simple splenectomy. In this latter group a shunt operation was not feasible for technical reasons.

A follow up from two months to three years has revealed a postoperative mortality rate of 5.5 percent (two patients). There were two minor postshunt hemorrhages, an incidence of 5.5 percent. Both patients have since gone two years without subsequent bleeding. The over all results indicate the value of the shunt operation in patients with portal hypertension and esophageal varices who have yet to experience their first but perhaps fatal hemorrhage.

Cardiologists have been impressed by the frequent association of coronary heart disease and gallbladder disease. The differentiation between biliary colic and an attack of angina is at times most difficult. There is a certain amount of evidence that coronary symptoms are aggravated by recurrent attacks of biliary colic. Surely it is better to remove the gallbladder early in a patient having myocardial damage than to wait until he develops one of the complications mentioned.

—CHARLES D. BRANCH

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ACTIVE TUBERCULOSIS IN NAVY NURSES, 1941-1950

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STUDIES of incidence rates for tuberculosis in naval personnel¹⁻³ revealed that nurses have had consistently higher rates than other naval personnel. A review of case records for 1949 suggested an association between cases developing among medical department personnel and the care of patients, although the number of cases during this year was too small for detailed analysis. A 10 year retrospective study of active tuberculosis among members of the Navy Nurse Corps was therefore initiated in the hope of assessing such factors as when the infection was acquired, selection, age, exposure, and assignments of personnel before and after entering naval service.

The authorized strength of the Nurse Corps as prescribed by Public Law 381 is 0.6 of 1 percent of the total naval personnel.⁴ In the period 1941-1950 rapid mobilization resulted in an increase of the Nurse Corps from about 800 in 1941 to over 11,000 in 1945. The number dropped to approximately 5,500 in 1946, and decreased gradually during 1947-1950 to less than 2,000. During the last six months of 1950, the strength of the Corps again increased to over 2,000.⁵

METHOD

The central medical records of the 151 cases tabulated as tuberculosis in the statistical⁶ and retirement files of the Navy Nurse Corps for the period 1941-1950 were reviewed. Diagnoses were assigned using the National Tuberculosis Association criteria then in effect.⁷ Only those patients in whom bacteriologic confirmation was obtained, or serial roentgenograms of the chest revealed evidence of a changing lesion, or pathologic tissue findings were typical were classified as active.⁸ The exceptions to this rule were eight patients with pleural effusion without bacterial confirmation of these, six reacted positively to tuberculin skin tests, one had a doubtfully positive reaction when

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vironments of these patients were different from those which might be expected for nurses in general

GENERAL BACKGROUND OF PATIENTS

The 100 patients in this study were white women diagnosed as having active tuberculosis while serving with the Nurse Corps, U S Navy, at some time during the period 1941-1950. Only two of the patients had entered naval service before 1940, while 72 had entered during the years 1942-1944. The length of graduate experience prior to naval service ranged from three months to 18 years, with 61 having less than two years of prior experience.

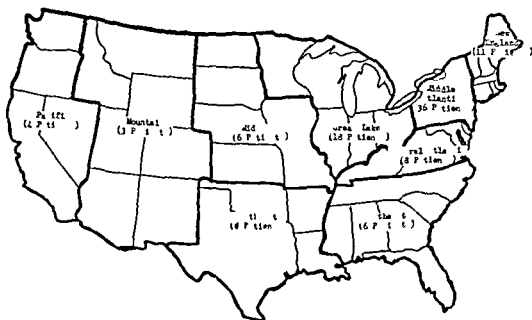


Figure 1 Geographic distribution before entering naval service

The 100 patients were graduated from 91 schools of nursing in 30 states and the District of Columbia. Six schools were represented by two patients each, two were students in the same class, and six were members of the same student body for one school year. Sixty-one of the patients had been students in schools located in the Atlantic Coastal States and 38 were from schools in the Middle Atlantic region (New York, Pennsylvania and New Jersey). Seventy-two patients were between 16-19 years of age at the time of admission to a school of nursing; the age of graduation ranged from 1921-1948, with 73 graduates between the years 1939-1944.

As indicated in figure 1, almost two thirds of the patients entered the service from the Atlantic Coastal States. Most of the patients were born and spent their childhood in the

patients 53 lived in urban 29 in rural and 18 in both rural and urban communities during childhood

AGE AND RATES

The average age of nurses admitted for active tuberculosis during the 10 year period was 27.2 the average length of service was 26.1 months. Patients admitted with extrapulmonary tuberculosis were younger and of shorter service 24.6 years of age and 9.9 months of service, respectively. The trend in rates for active tuberculosis among nurses rose from 1.5 per 1 000 average strength in 1941 to a peak of 4.6 per 1 000 in 1946. It then fell to 1.5 per 1 000 in 1948 where it remained until 1950 when it rose slightly. Both age and length of service distributions of the Nurse Corps were available only for the period 1945-1947. The rates for active tuberculosis during the three year period were for nurses under 25 years of age 4.4 per 1 000 average strength for nurses 25 to 29 years of age 3.1 per 1 000 and for older nurses 3.0 per 1 000. When length of service was considered nurses with less than three years of service had a rate of 3.3 per 1 000 and those with longer service 4.6 but statistical analysis of the data indicates that chance alone might account for these differences.

METHOD OF DISCOVERY

Table 1 shows that 58 cases were discovered by routine chest roentgenograms. If only pulmonary cases are considered the percentage is 69 which is considerably higher than the 53 per cent of pulmonary tuberculosis cases found by routine roentgenographic examination as reported in the 1949 study of tuberculosis among naval personnel. Of the 58 cases detected on the periodic roentgenographic examination 24 were found at the annual physical examination eight at the end of the first six months probationary period nine during or after tuberculosis ward service, four at the time of examination for promotion one before going overseas and 12 at the time of the physical examination before separation from service.

Of the 38 cases discovered through investigation of symptoms all but nine patients had had the required periodic chest roentgenogram within 14 months of admission to the sick list, and in only two instances had the annual examinations been delayed for more than a year. In only 12 of the 38 patients were the routine roentgenograms prior to admission to the sick list available for review and there is no assurance that they constitute an unbiased sample of those eight contained abnormal shadows which might have been considered cause for clinical investigation. The preservice roentgenogram of one nurse whose most recent routine film was reported as negative was positive on review.

Although 100 percent efficiency in detecting small abnormal shadows is not to be expected even when roentgenograms are interpreted independently by two experts, these data serve to re-emphasize the care that must be exercised in reading large numbers of roentgenograms among which only a few will reveal significant defects. They also suggest the importance of reviewing serial roentgenograms and of obtaining interpretations of at least two competent roentgenologists when passing on the fitness of candidates for the Navy Nurse Corps.

HISTORY OF TUBERCULOSIS CONTACT

The history of contact with tuberculosis of the 100 patients was compiled into four categories: (1) contact in naval service only; (2) contact in naval service and civilian life; (3) contact in civilian life only; and (4) no known contact. Contact with tuberculosis was considered to be service on tuberculosis wards, familial contact, or exposure to patients or associates who were later found to be tuberculous. The number of contacts probably is incompletely reported because information in 22 cases is confined to the official records.

As indicated in table 2, 83 patients had had known contact with tuberculosis before being admitted to the sick list. Although the numbers reported are too small to support a definite conclusion, it appears that the possibility of contact with tuberculosis is greater the longer a nurse remains in naval service. This situation might be expected inasmuch as a member of the Nurse Corps may be assigned to any type of clinical service, whereas she might choose not to practice in a particular clinical field in civilian life.

Thirty-one nurses had contact with tuberculosis at the naval station in which their disease was detected. 24 had contact at a station previous to the one in which it was diagnosed, seven had contact at both stations, and four reported contact while in naval service without indicating the station at which it occurred.

Of the 66 patients who had contact with tuberculosis in naval service, 55 had tuberculosis ward experience and 11 reported exposure to patients or associates who later were found to have tuberculosis. Twenty-nine of the 55 who were exposed in tuberculosis wards reported additional exposure to patients or associates who were later found to be tuberculous. The length of tuberculosis ward experience ranged from less than a month to 22 months, and the average time spent on tuberculosis wards was 4.6 months. Of the 10 exposures on other than tuberculosis wards, 10 were to patients only, 18 to associates only, and 10 to both patients and associates. In 21 instances close contact

TABLE 2 *History of contact with tuberculosis*

Place of contact	Number of patients	Months of service prior to admission to sick list				
		0-5	6-11	12-35	36-59	60 or over
In naval service only ¹	23	1	2	11	8	1
In naval service and civilian life ²	43	8	6	19	9	1
In civilian life only ³	17	2	8	6	-	1
No known contact ⁴	17	5	2	8	2	-
Total	100	16	18	44	19	3

Information limited to official records

¹ For three patients in the group of two patients in the group of ten patients in the group of seven patients in the group

One patient on second tour of duty entirely service counted

with the tuberculous person was reported. Of the 21 reporting close contact six reported being examined every 2 or 3 months by means of chest roentgenograms. 11 reported no examinations and four failed to answer the question. In six cases the type of ward in which exposure occurred was specified: two surgical, one general medicine, and three chest observation wards. Twenty-one nurses were listed as tuberculous contacts, 16 of whom were named. Of the 16, two were named twice by patients. All except one of the named contacts are included in this study.

Of the 60 patients who had known contact with tuberculosis in civilian life, five reported that the contact occurred during the preservice graduate period, 44 reported that it occurred during the student nurse period, seven reported that contacts occurred during both the student and preservice graduate periods, and four reported that it occurred either before entering a school of nursing or outside the nursing environment. Forty-three of the 60 also had contact with tuberculosis while in naval service.

Six patients reported having practiced in tuberculosis nursing during their pre-service graduate period. Five of these reported having 6, 10, and 13 months and 2 and 10 years' experience, respectively, in this clinical service; the sixth reported being a supervisor in the operating room of a tuberculosis center for three years. Three patients reported occasional contact with known tuberculous patients during the course of their graduate duties as public health and staff nurses. Two patients had taken postgraduate courses in tuberculosis and communicable disease nursing prior to entering naval service but had not practiced in this field after completing the courses. Two nurses had familial contacts with tuberculosis during the period between graduation from a school of nursing and entering naval service.

Twenty-six patients had planned clinical experience in tuberculosis while student nurses; the experience varied from two weeks to three months, with one patient having such experience throughout her training. Twenty-nine patients reported exposure to patients or classmates who were later found to be tuberculous. Thirteen reported exposure to patients, 13 to classmates, and three to both patients and classmates. Eleven of the 29 reported that they had chest roentgenograms once after exposure; eight did not remember, and 10 stated that they had not had a roentgenogram. Six of the exposures to patients were on surgical wards, one was in chest surgery, and nine were on medical services. Three patients stated that they took strict precaution while they were student nurses when caring for suspected tuberculous patients.

HEALTH PROGRAMS

The health program in naval service relating to chest roentgenograms for nurse personnel is as follows: one roentgenogram is taken prior to active duty, one at the end of the first six months, one annually, and one before promotion, overseas assignment, or separation from the service. The policy governing routine, periodic, chest roentgenograms in relation to tuberculosis wards is the prerogative of the individual command of the naval medical facility.

As shown in table 3, at least 85 of the 100 patients had had routine chest roentgenograms within a year of admission to the sick list for tuberculosis. The five patients reporting chest roentgenograms every two or three months were on tuberculosis services at the time of admission, and three of those reporting the annual roentgenogram as the last before admission also reported having had chest roentgenograms every two or three months when working on tuberculosis services.

Only six patients reported that they had had tuberculin tests in naval service before hospitalization. These six were equally divided among those having and those not having contact with tuberculosis while in naval service.

During the period between graduation from a school of nursing and entrance into naval service, routine, periodic, chest roentgenograms were confined to those practicing in institutional and public health nursing.

Sixty-five patients had chest roentgenograms at some time while students in schools of nursing. Tuberculin tests were reported by 24 schools. Five students were reported to have converted to positive reactions during the first half of their second year, but no relationship to tuberculosis ward experience could be established. Only two students were reported as having tuberculin negative reactions at the time of graduation from a school of nursing. Table 4 shows the increasing use of routine chest roentgenograms and tuberculin tests by schools of nursing during the period the 100 patients in this study were student nurses. Although our information relating to the health programs of the schools of nursing at the time these nurses were students is limited, the reported number that gave periodic chest roentgenograms is better than that reported by the 1944 United States Public Health Service survey.⁷ The number of tuberculin tests reported is better also, 11 of the 60 schools gave tuberculin tests on admission, as compared with 11 of the 90 schools reported in the Health Service survey.

TABLE 3. Losses by type of injury, by month, by day of month, by day of month, by day of month.

Type of injury	Number of patients	Month				Day of month		Total
		0-5	6-11	12-35	36-59	60 or later	60 or later	
All	43			25	17	1	1	
Shallow	6			5	1			
Intermediate	5	1	2	1			1	
At depth	27		16	9	1		1	
Unrecovered	19	15		4				
Total	100	16	18	44	19		3	

TABLE 4 *Roentgenograms and tuberculin tests while patients were in schools of nursing*

Year of graduation	Number of patients	Roentgenograms during training		Tuberculin test during training	
		Number	Percent	Number	Percent
Prior to 1933	7			-	
1933-1938	13	4	30	1	8
1939-1941	28	18	64	6	21
1942-1944	45	36	80	13	29
1945 and later	7	7	100	4	57
Total	100	65		24	

Illnesses prior to entering naval service that might be of significance were found in six instances. Two patients had spent nine and 18 months respectively in tuberculosis hospitals for pleurisy while student nurses, the semiannual roentgenograms of one patient, while a student nurse, showed pleurisy, right base, one patient, in her second student year, had pneumonia with effusion, one had a history of influenza three times while a student, and, as a graduate, one had been ill for five months with pneumonia complicated by pleural effusion, less than a year before entering naval service. One patient had a local and focal reaction to a tuberculin test while in student tuberculosis affiliation; the reaction was repeated prior to admission to the sick list in naval service.

On the basis of information available for this study, the query posed by Britten and Charter³ as to whether the infection was acquired before or after entering naval service, cannot be answered. The limited number of patients who were tuberculin tested before and after entering naval service does not help to pinpoint the answer. In only 12 instances do the reported tuberculin test results serve to identify *approximately* when the infection *might* have been acquired: two before entering the nursing environment, five during the student nurse period, and five after entering naval service.

The study did reveal that 83 of the 100 patients had known contact with tuberculosis, that the number reporting known contact with patients and associates on other than tuberculosis wards is about equal to the number reporting tuberculosis ward experience, and that in six instances the histories of illnesses prior to entering naval service might have been cause for failure to meet standards of physical fitness for commission.¹⁰

COMPARISON WITH PUBLISHED SURVEYS

An adequate unbiased sample of all nurses in naval service during the period of this study was not available for comparing background and experiences of the patients and the Nurse Corps as a whole. An October 1945 survey¹⁴ was used for comparative purposes because it did report selected factors concerning the Nurse Corps at its wartime peak and was conducted at a time midway in the period of this study. The factors selected for comparative purposes were geographic distribution of nurses before entering naval service months of post Pearl Harbor noncontinental duty and age rank and length of service. The factors of age rank and length of service in the 1945 survey were compared with similar factors in the patients' histories at the time of admission to the sick list for tuberculosis.

Statistical analysis showed that the differences in age and in post-Pearl Harbor noncontinental duty were not significant. The 1945 survey reported that 48.2 percent of all the nurses were under 25 years of age and that 72.7 percent were less than 30 years of age as compared with 43 percent under 25 years of age and 76 percent less than 30 years of age in the present study. Seventy-eight percent of all the nurses in the 1945 survey had none or less than six months and 7.4 percent had less than a year of post Pearl Harbor noncontinental duty as compared with 79 and 11 percent respectively for the patients.

TABLE 5. Geographic distribution of patients with tuberculosis before entry into service, 1945 survey.

Geographic location	1945 survey (percent)	Present study (percent)
Northwest	15	11
Middle Atlantic	28	36
Central Atlantic	4	8
South	7	6
Great Lakes	21	18
Midwest	9	6
Southwest	5.5	8
Mountain	3	3
Pacific	7.5	4

Medical Service Department Dental Bureau of Medicine Surgical

TABLE 6 *Preservice field of nursing of 100 patients compared with 1945 survey¹¹ and the 1944 Facts About Nursing¹²*

Preservice field of nursing	1945 survey ¹¹ (percent)	Present survey (100 patients) (percent)	Preservice field of nursing	1944 Facts ¹² (percent)	Present survey (100 patients) (percent)
Staff nurses	54	62	Institutional	63	70
Head nurse	20	7	Private duty	17	17
Supervisor	9	9	Public Health	6	7
Private duty	9	17	Industrial	3	2
All other	8	5	Other	4	4
			Unknown	7	

varices with decreased pressure were esophagoscopy examination One patient had a splenorenal shunt four months prior to the hemorrhage esophageal varix pressure was 210 mm patient had a splenorenal shunt prior to the bleeding episode At that time the pressure was 274 mm of saline Hemorrhage in either case because the postshunt pressure was 300 mm critical level It is encouraged to have gone two years without subsequent bleeding indicate that factors other than portal hypertension are partly responsible for hematemesis

SUMMARY

In a study of 36 patients with portal-caval shunt is considered the treatment employed in 25 patients A splenorenal shunt in six patients and five required less than hepatic artery ligation and simple ligation group a shunt operation was not feasible

A follow up from two months to two years postoperative mortality rate of 5 per cent were two minor postshunt hemorrhages percent Both patients have since had no further bleeding The overall results indicate that shunt operation in patients with portal-caval varices who have yet to experience a fatal hemorrhage

Cardiologists have been impressed with the association between coronary heart disease and gallbladder disease between biliary colic and an attack of coronary There is a certain amount of evidence that attacks are aggravated by recurrent attacks and that it is better to remove the gallbladder early in the course of the disease than to wait until he develops a

—CHARLES D
Surgical Gynecologist

TABLE 7 Rank and length of service

Length of naval service	1945 survey ¹¹ (percent)	Present survey (100 patients) (percent)	Rank	1945 survey ¹¹ (percent)	Present survey (100 patients) (percent)
0-11 months	32.6	34	Ensign	44.4	52
12-35 months	55.2	44	Lieutenant junior grade	41.3	27
36-59 months	9.6	19	Lieutenant	14.3	21
60 and over	2.6	3			

TABLE 8 Student experience compared clinically

Special clinical service	78 nurses participating (percent)	NLNE Survey	
		Y	
		1939 (percent)	1943 (percent)
Tuberculosis	33	32	34
Communicable disease	50	56	56
Psychiatry	51	50	54
Outpatient	50	57	58
Physical Health	20	32	30

Information concerning the types and duration of clinical experiences exposures to tuberculosis and stations of duty for all Nurse Corps personnel was not available for comparison with the 100 patients in this study. The experiences of the patients in this study on special clinical services while student nurses is limited to 78 replies to the questionnaires. The student experiences reported were checked with the 1931, 1935, and 1943 editions of 'List of Schools Meeting Minimum Requirements' and with the 1946 edition of 'State Accredited Schools of Nursing' published by the National League of Nursing Education. In all but one instance the reports of the patients and the League were in agreement. The student experiences reported were also compared with the report from the Department of Studies of the National League of Nursing Education. The two years of the report, 1939 and 1943, represented the period when most of the patients in this study were student nurses. Table 8 demonstrates how closely the experiences of these patients resembled the common practice at that time.

SUBSEQUENT HISTORY

The 100 patients in this study were classified according to manner of disposition listed in the official records (table 9). Four of the 90 patients listed as retired were those whose disease was detected less than nine months after leaving service and was considered to have been active while in the Navy. One of the nurses released to inactive duty and one of those who resigned are now receiving veterans' pensions for service connected tuberculosis. In addition to the two patients who died in service, two later died in retirement and one died after release to inactive duty. It must be presumed that the eleven nurses who did not answer the questionnaire are living because they are still being carried on the retirement rolls. The status of five of the

100 nurses is not known, they have had no communication with the Navy since 1944, their current addresses are not available and they are not receiving retirement pensions from the Navy or the Veterans Administration. Information is therefore available in regard to only 5 deaths among the 100 nurses who were diagnosed as having active tuberculosis while in naval service.

TABLE 9 Disposition of 100 nurses with active tuberculosis

Disposition	Number
Retired	90
Released to inactive duty	3
Resigned	2
Revocation of appointment	3
Deceased	2

Of the 78 nurses who replied to the questionnaires, 46 reported that they are now married. Seven reported having one child, two reported two children, and one reported having three children. Two of the nurses have married former tuberculous patients.

Forty nine of the 78 nurses reported that their disease was classified as arrested or inactive and that they have had no further disease activity since separation from service. Fifteen nurses reported reactivation after their disease was considered arrested, but later was once again classified as arrested. Six nurses reported their disease as being classified as still active and four reported it active and having spread. Eight of the nurses did not report the status of their disease.

Sixty two of the nurses reported being under the supervision of a private physician or at a tuberculosis sanatorium. Of the married nurses reported medical supervision, one reported that her child had tuberculosis. Seven nurses reported that they were still under medical supervision. One reported thorax or pneumoperitoneum, one reported thorax and pneumonectomy, and one reported thorax and pneumonectomy since separation from naval service.

In response to the query as to how they felt, 29 reported that they felt well, 19 reported that they felt fairly well with rest periods, 10 reported that they were semi invalids and two reported that they were invalids. Only seven reported that they felt very well and were occupied in their activities, and were occupied in their activities.

classes Thirty one reported being engaged in part-time housework nursing or attending classes The long term effects of tuberculosis upon the lives of individuals is clearly demonstrated in the reports from these 78 nurses particularly when it is noted that the majority have now been separated from service for more than five years

SUGGESTIONS FOR CONTROL

Forty five of the 78 nurses offered the following suggestions which they thought might aid in control or prevention of tuberculosis among Navy nurses

S g g t	N mb of nurs offe g gg t o
In- pe on l d c t on	11
Roe tg gr m f th h t v ry 3 month f p onn l n tuber ul is d ch t ward	8
Roe tg n gr m f th h t ry 6 month for ll ur	7
Standardize p e t on t h t be ul w d	7
P ov d bette f llow-up t d for t be ul t t	4
L m ig m t t t berc los ward to 3 months	4
Roe tg gr m of th he t fall dmis	4
Inst ru p e ut te hn for h t w d	4
Pr id 40-hour workw k	4
Provid pat t-edu t n p o- gr m	4

Of the 11 nurses who suggested personnel education eight remarked that they wished they had been instructed in tuberculosis nursing before being assigned to tuberculosis wards Four of the 11 who suggested personnel education also suggested patient education It was noted that these four had been hospitalized in private tuberculosis hospitals after separation from service and stated that they realized the value of education in the control and prevention of tuberculosis Of the seven who suggested standardization of technics in tuberculosis wards four stated that they realized there was no definite proof of the value of masks but that the tuberculosis hospitals in which they had been patients or had visited used masks when in close contact with patients

SUMMARY AND CONCLUSIONS

During the 10-year period, 1941-1950 100 Navy nurses were admitted for treatment of active tuberculosis. The histories of the patients were reviewed and the findings compared with information available in nursing surveys published during the period. In general, the patients had about the same student nursing postgraduate, and naval experiences as the nurses in the surveys. Although exceptions were noted in respect to postgraduate experience, state of residence prior to entering naval service, and rank and length of service, no consistent pattern of factors was noted that would identify the patients as a group in which tuberculosis would be more apt to occur than in nurses in general.

Although most of the cases were officially accepted as incurred while on active duty, the medical evidence that infection had occurred during naval service was not convincing. Contact with tuberculous persons was reported almost as frequently before as after entering naval service. In 29 instances in which the pre-service roentgenogram of the chest was available for review, 12 contained suspicious shadows and three were technically unsatisfactory. In six other cases, histories of previous illnesses that might have been cause for rejection under regulations current at the time of appointment were given at the time of entering naval service. The general lack of periodic tuberculin testing of nurses either before or after entering the Navy added to the difficulty of arriving at any decisions concerning the time or place in which infections were acquired. Opportunity to significantly lower the incidence of tuberculosis among Navy nurses exists in reducing to a minimum the number of persons accepted for active duty whose medical histories and chest roentgenograms reveal disqualifying evidence of tuberculosis.

This review re-emphasized the hazard to medical personnel of acquiring tuberculosis during their training and postgraduate years and the necessity for constant attention to communicable disease precautions, in service personnel education routine tuberculin tests and chest roentgenograms and careful medical observation of known tuberculosis contacts.

The current requirement for routine periodic tuberculin testing of medical department personnel on duty in naval hospitals, with careful follow up studies of persons whose tests convert to positive and for routine chest roentgenograms before, during, and after assignment to wards where tuberculosis patients are cared for, are steps which should result in locating some of the sources of infection within the naval service. The consistent trend toward better health programs for nursing personnel noted during the period of study should result in lower disability rates for nurses in the future.

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Tea Coffee Alcohol and Tobacco

The most important items in the social pharmacopoeia of today are the stimulant tea and coffee the depressant alcohol and the mild analgesic tobacco. These are prescribed and dispensed on a vast scale by people who have no knowledge of their pharmacologic action. Dosage is decided empirically in a way which might have more serious results were it not that man's body is in some ways wiser and more experienced than his mind. All the socially prescribed drugs have pleasant and apparently beneficial effects in suitable doses. All of them can have harmful effects when wrongly used.

—I F BECK

n La t p 392 A g 22 1953

COARCTATION OF THE AORTA

HAROLD A LYONS *Commande MC USA*

A GREAT deal concerning coarctation of the aorta has appeared in the literature over the past several years probably because of the stimulation given to the problem by the marked advances in vascular surgery. Gross,¹ Gross and Hufnagel,² and Crafoord and Nilin³ independently described the surgical correction of this congenital abnormality and gave impetus to the study of the recognition and other features of the condition.

That cases are still being unrecognized is realized from the large number that are discovered routinely in hospital patients undergoing care and treatment for unrelated conditions or supposed hypertensive cardiovascular disease. The problem remains a large one in the military services because the condition in persons entering the service escapes recognition and remains undiagnosed even when the patient is being treated for the various symptoms that are produced. If the condition is recognized it may be corrected surgically, thereby salvaging the patient for the service, benefiting him by the prospect of long life and relief of symptoms and minimizing the necessity of prolonged government pension payments.

The number of physical examinations and hospitalizations which these patients have undergone without detection of the abnormality indicates the frequency of failure to recognize it. These facts are expressed in tables 1 and 2.

This congenital abnormality has been described in many previous articles.⁴⁻⁶ Briefly it is a narrowing of the aortic arch sufficient to obstruct the flow of blood. This constriction usually occurs just distal to the left subclavian artery and may appear as an angulated continuation of the aorta. Edwards and co-workers⁷ demonstrated that the constriction is mainly a peculiar invagination of the aortic wall and is more marked than the outside wall would indicate (fig. 1). The media turns in at this point to form a diaphragm with the remaining small opening at the caudal or concave portion of the arch. It is this the adult type of coarctation which concerns us. The constriction is sometimes

TABLE 1 *Physical examination of patients
before and after treatment*

Patient	Number of physical examination	Number of hospital days	Years
1	5	0	8
2	12	4	10
3	10	3	7
4	6	1	8
5	6	2	3
6	18	4	22
7	23	5	31
8	3	0	0
9	4	1	0
10	2	0	0
11	3	1	3
12	2	0	0
13	3	1	2

TABLE 2 *Age of patients
before and after treatment*

Patient	Age (years)
1	18
2	20
3	19
4	32
5	22
6	58
7	53
8	15
9	30
10	26
11	19
12	22
13	21

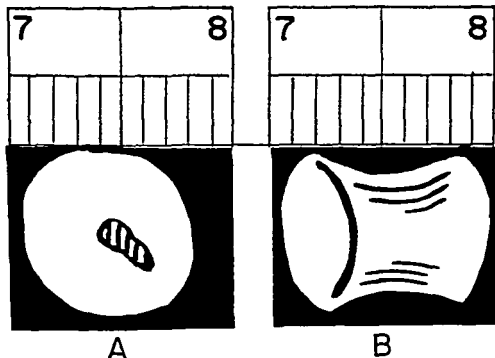


Figure 1 Sketches of an actual surgical specimen of the coarcted segment of an aorta removed from one of the patients (A) Cross section view (B) Longitudinal view. Note the small lumen in (A) which measures only 0.3 mm.

at the subclavian artery or occasionally above it. This last has been called the infantile type. Usually the obstruction for practical purposes is complete, as indicated by pathologic studies.

PHYSICAL EXAMINATION

The diagnosis is usually evident if the simple procedure of palpation of the femoral arteries is carried out. Diminished or absent pulsations of the femoral arteries should arouse suspicion. It is stated that Sir Thomas Lewis, after learning of the condition while visiting in this country, returned to England and by re-examining the hypertensives in his clinic with palpation of the femoral arteries discovered a goodly number of patients having a coarcted aorta. Hypertension in the upper extremities especially that occurring in a young person, indicates the need for examination of the femoral arteries for reduced pulsations. The hypertension may not be great. Some of the cases reported here and elsewhere exhibited systolic pressures in the upper extremities of only 130 to 145 mm Hg. When simultaneous hypotension is discovered in the lower extremities, the diagnosis is practically certain.

Pulsating collateral vessels either visible or palpable, in the interscapular area, in the anterolateral regions of the chest, in the area below the breasts, or in the superficial epigastric region will if present be helpful in making the diagnosis. A systolic

murmur at the base of the heart will provide an added indication. Most commonly it is of moderate intensity. Every patient included in this report exhibited such a murmur but it is sometimes absent. It must be remembered that the murmur may arise not in the aorta but in the dilated collateral channels especially the internal mammary arteries. Sometimes a diastolic aortic murmur is also heard indicating the possibility of a bicuspid aortic valve. This coincident congenital anomaly has been reported in from 15 to 20 percent of the patients with coarctation of the aorta. A diastolic murmur on occasion may represent some other type of aortic valvular disease or if in the mitral area indicate associated mitral valvular disease. The systolic murmur may be heard over the entire precordium with its maximum intensity at the base. In many patients it radiates to the back and may be heard in the interscapular area.

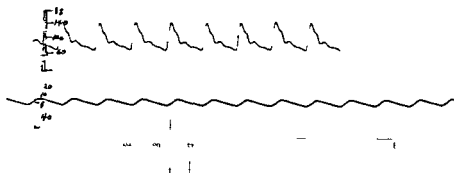


Fig. 2. Simultaneous record of brachial and femoral arterial pulsations made by direct method. Note the plateau type of wave obtained from the femoral artery the delay in peak and the low pressure systolic pressure pre-reduced the femoral artery.

When the murmur arises in the collateral vessels it usually is continuous in character being accentuated during systole and minimal during diastole. A patent ductus arteriosus may also give rise to the continuous type of murmur. Two of our patients (9 and 11) had this associated condition. It has been reported by Abbott and others to occur in about 10 percent of the patients with coarctation of the aorta.

Direct femoral arterial pulsations in all the patients showed a typically slow rise of the peak at systole. Figure 2 illustrates an example of this finding. It is primarily this slow rise which accounts for the difficulty in palpating the pulse in the femorals. It is a clinical sign that may aid in making the diagnosis and can be recorded in the ordinary hospital heart station or practitioner's office by means of the usual gelatin pulse capsule and electrocardiographic timing of the onset and peak of the systolic waves of both the brachial and femoral arteries. If it is

found when the measurements are compared that the femoral times are delayed, the presence of a coarctation of the aorta may be assumed

In some patients there may be signs of differences in circulation to the arms, demonstrated by smaller pulses and lower blood pressures. These signs appear more commonly in the left arm because the constriction is frequently located proximal to the origin of the left subclavian, but they may appear in the right arm if there is stenosis of the origin of the right subclavian artery.

Auscultation of the head may reveal a bruit indicating the presence of a cerebral aneurysm, which is a frequent associated congenital anomaly. The retina may show the usual vascular changes of hypertension (nicks and hemorrhages) or very tortuous arterial vessels. Some believe that this extreme degree of tortuosity is characteristic of coarctation of the aorta. Subarachnoid hemorrhage is another cerebral episode which may occur. It has been noted that systolic, diastolic, and pulse pressures tend to be highest in those patients who die from a cerebral episode. In a few cases there is increased blood flow in the upper part of the body, and one may find prognathism, overdevelopment of the upper as compared with the lower extremities, unusually warm hands, and high facial coloring.

SYMPTOMS

Symptoms may be absent especially in children and adolescents when the degree of the constriction of the aorta is not extreme. These may develop the usual symptoms of hypertension, however exhibiting flushing, headaches, epistaxis, and pounding sensations in the head. The pounding sensations may be accentuated by stooping or bending. Coldness, pallor, and numbness of the legs and feet are frequent complaints. Pain and intermittent claudication may be present. Weakness of the legs, sometimes marked, may be a prominent complaint. When there is an obstruction of one of the subclavian arteries, coolness, pallor associated with numbness and tingling are present.

Back pain if constant and prominent may be a bad prognostic sign indicating an impending dissection of the aorta.

ROENTGENOLOGIC FINDINGS

Often it is only because of abnormal roentgenographic findings that investigation of the patient is initiated, but even these abnormalities have not been recognized in the patients reported on in this article. The best known roentgenographic findings are the notching of inferior portions of the rib originally described by Rallsback and Dock.¹ Notching of the ribs stands out as a very characteristic and almost pathognomonic finding. In the

patients reported here however it was not frequently seen Other conditions that may produce notching of the ribs are neurofibromatosis pulmonary arteriovenous fistulas engorged intercostal veins severe pulmonary artery stenosis aortic valvular disease tetralogy of Fallot obstruction of superior vena cava and vascular malformation of the thoracic wall It has been reported that notching is absent in about 15 percent of the cases It may be

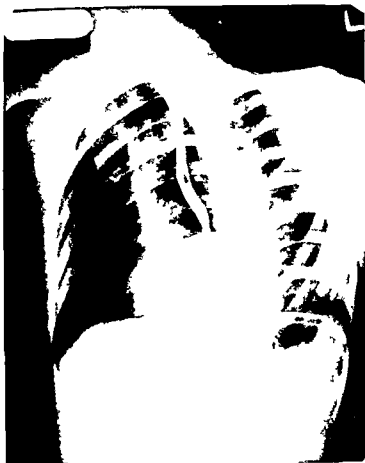


Fig. 3. Left anterior oblique roentgenogram of patient showing aortic knob and heart shadow at apex of shadow.

easily overlooked and if the stenosis of the aorta is not severe enough to cause the development of large collateral vessels it may never occur Theoretically it should result only after several years of hypertension however it has been reported by Pugh in an eight-year-old child and by Neulaiser¹ in a nine-month old baby

Other signs seen in the roentgenogram of the chest are concerned with the aortic knob A common roentgenographic finding

is the presence of an abnormal knob shadow. The knob may lack prominence, or dilatation or bilobulation may be seen. The bilobular appearance may be the result of the poststenotic dilatation of the descending aorta. This poststenotic abnormality may also cause a characteristic deviation of the barium filled esophagus (fig. 3). Occasionally a visible notch is seen in the aorta. This is a sign which has been previously described but which recently

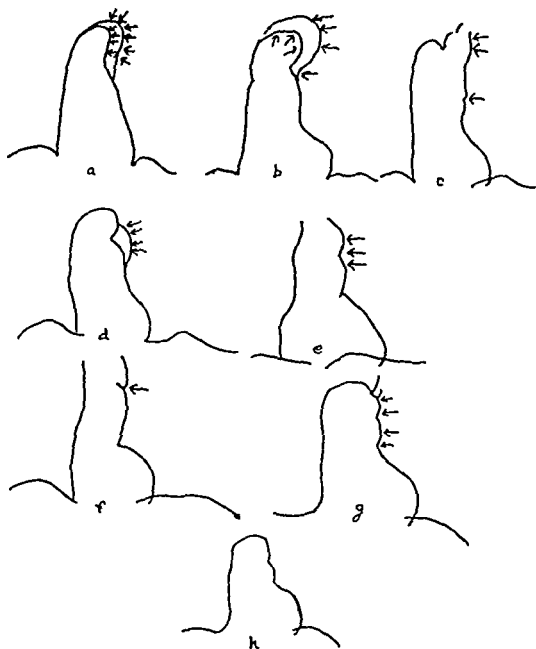


Figure 4. Diagrammatic sketches of abnormalities of the aortic contour made from actual tracings of roentgenograms. (a and b) Double knob contour. (c) Dilated isthmus with a very arching and notching along descending aorta. (d) Shadow produced by poststenotic dilatation of descending aorta. (e, f and g) Notching and indentations of descending aortic shadow. (h) Absent aortic knob.

has received re emphasis by Bruwer and Pugh. In the left anterior oblique view an unusual clearness of the aortic window is seen. Left ventricular enlargement as a result of the hypertension is usually present. Dilatation of the left subclavian artery may be a prominent feature. On fluoroscopic examination this vessel may be observed to have greatly increased pulsations. Because of this finding of a prominent dilated left subclavian artery one of our patients (No 7) 56 years of age was admitted with the diagnosis of a mediastinal tumor. The ascending aorta may be seen on conventional roentgenograms to be dilated. This

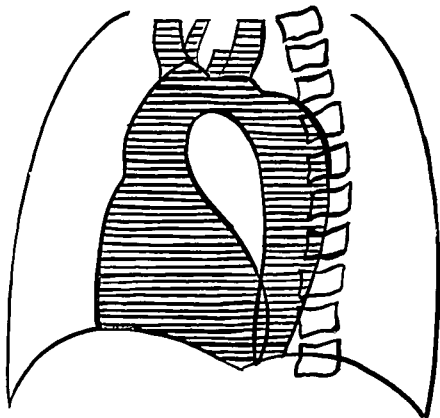


Fig 5 Diagram of left anterior oblique roentgenogram of the chest illustrating the large aortic window and the dilated descending aortic shadow.

may be merely an additional finding. Figure 4 shows diagrammatic sketches of these abnormalities of contour made from tracings of roentgenograms. Figures 5 through 9 illustrate other findings. Table 3 is a tabulation of the physical findings and other features discovered in each case.

The most valuable method for accurately outlining the point of aortic constriction is angiocardigraphy as described by Robb



Figure 6. Posteroanterior roentgenogram of the chest of patient 8 showing the double aortic shadow. Figure 7. Posteroanterior chest roentgenogram of patient 11 showing small aortic knob and notched ribs indicated by arrows.



Fig 8 A glo radio m sp i t 7 bowi g d lat d l ft b layi w artery c i t d gm i f t d i l to ibi d l i d d c d
i g ta, l i widow and i g d l ft i l Figur 9 L ft a teri bliq glo di gr m of pat t 8 bowi g c m
at l c d gm t a d d l t d d di g ao ta N t b mc of l ft w i i ular i gem t

TABLE 3 Physical and roentgenologic findings confirmed by angioca diography

Patient	Elevated left subclavian artery	Abnormal contour	Notched ribs	Left ventricular enlargement	Systolic basal murmur	Diastolic murmur	Hypertension in upper extremities	Hypotension in lower extremities	Visible collateral	Palpable collaterals
1	0	+	+	+	+	0	+	+	0	0
2	0	0	0	+	+	0	+	+	0	0
3	0	+	+	+	+	0	+	±	0	0
4	0	+	0	0	+	0	+	0	0	0
5	0	+	0	+	+	0	+	+	0	0
6	0	+	+	+	+	0	+	+	+	+
7	+	+	0	+	+	0	+	+	0	0
8	0	0	0	+	+	0	+	+	0	+
9	0	+	0	+	+	+	+	+	0	0
10	0	0	+	+	+	0	+	+	0	0
11	0	0	0	+	+	0	+	+	0	0
12	+	0	+	+	+	0	+	+	0	0
13	0	+	0	+	+	+	+	+	0	+

This murmur is from patent ductus arteriosus

and Steinber.¹² Even though Gross³ has not found this method satisfactory it is still the best and safest method and affords excellent visualization when the technic is highly developed. It is indispensable in the examination of any patient likely to undergo surgery for coarctation of the aorta because (1) exact anatomic localization of the site is achieved (2) information regarding hemodynamic consequences is given (3) the surgeon is provided with the data he needs for planning the operation (4) it indicates whether an arterial graft will be required and (5) the usual type of coarctation of the aorta can be distinguished from the unusual one located in the descending aorta. The findings found on angiocardiology have been adequately described by Lotter and co-workers.

OTHER CONSIDERATIONS

There are all degrees of coarctation of the aorta. The majority represent for all practical purposes complete occlusion but there are a few with positive roentgenologic and angiographic findings



Fig 10 B I I t ca diag an bo ng short J k segm t wh b w pr t
all fo p t t and b l a cha a ter t fnd g ct
of the aorta.

in which the blood pressure in the legs is either normal or only slightly reduced and that in the upper extremities is either normal or only slightly elevated. These are incomplete or subclinical coarctations of which a report will be submitted at a later date. The electrocardiogram, if it exhibits any abnormalities, will represent the left ventricular effects resulting from the hypertension. The ballistocardiogram characteristically shows a shortened J I segment (fig 10). It is the postoperative changes of the K wave toward normal and the blood pressure lowering that are indications of the successful surgical result.

SURGICAL CORRECTION

The surgical technic and considerations are well established since the original operations by Crafoord and Nylin and Gross and Hufnagel. Older patients are generally unsatisfactory subjects for operation because of the greater frequency of sclerotic changes

of the vessel walls, but Sealey¹⁵ has successfully operated on a 56-year old male. Although the most desirable age appears to be in the second decade, excellent results are obtainable in the 20 and 30 year age groups. One of our patients who was operated on was 34 years of age, and a good result was obtained. Very young children are also poor subjects because the aorta is small and the collateral vessels are not well developed adding greatly to the risk of the operation. The possibility of the anastomotic site failing to enlarge with the growth of the child is also a potent deterrent factor. Advanced cardiac enlargement, myocardial damage, and decreased cardiac reserve all add to the risk of operation, but after medical management are not contraindications. Hypertension, no matter of what degree, does not disqualify a patient for an operation, although if it is of long standing and in a patient over 20 years old, it certainly will increase the risk because of the changes in the aortic wall which may have resulted.

The results of surgical intervention are dramatic, although it may take a month for the blood pressure to return to normal levels. The femoral arterial pulses return to near or normal when the operation has been properly performed. If early diagnosis is made there is little doubt that the patient will be benefited by surgical treatment. The age group of the military services offers a fertile field for discovering patients with coarctation of the aorta who can be benefited by surgical means. Patient 5 was an Army hospital corpsman who had a satisfactory operative result and who has just returned from a two-year tour of combat duty in Korea. He is now four years postoperative. It is firmly believed that those who have this congenital abnormality surgically corrected may be salvaged for continued duty within the service bringing benefit to the government by keeping trained men in their positions and avoiding untold pension costs, as well as bestowing benefits to the patient by freeing him of symptoms and providing for a longer span of life. The average age at death of persons with untreated coarctation of the aorta is 30 to 39 years.

SUMMARY

Thirteen cases of coarctation of the aorta, diagnosed after the patients had undergone a number of physical examinations and in a few previous hospitalization illustrate the frequency with which the detection of the abnormality is missed on physical examination.

Diminished pulsations of the femoral arteries, with hypertension in the upper extremities and hypotension in the lower extremities are of particular diagnostic value.

Early detection and surgical correction are necessary if the patient is to enjoy long life, be symptom free, and is to continue duty in military service.

A 25 year old woman was transferred from another hospital with a diagnosis of chorea cause unknown. She was a German war bride who had been in this country less than one year. Her husband was overseas and she had been increasing nervousness, irritability, and unresolved conflict in her social and marital adjustment. Two weeks prior to admission there was an abrupt onset of continuous involuntary flinging movements of the extremities which were more pronounced on her left side. Emotions were labile but no bizarre ideation was expressed. She cried or laughed without apparent cause and she had fallen on several occasions because of the weakness and unsteady gait associated with the purposeless flinging movements.

She had a slightly enlarged thyroid gland and a slight degree of exophthalmos. Her pulse rate varied from 108 to 130 per minute. A soft systolic murmur without radiation (grade 1 in intensity) was heard in the second left intercostal space.

Routine laboratory data was without significant abnormalities. Sedimentation rate was 8 mm in one hour and remained normal throughout the hospital course. The spinal fluid was normal and the electrocardiogram was also within normal limits.

The hospital course presented a continuation of the choreiform movements and wide mood swings. Consultations were obtained from several specialists, all of whom believed that the patient had chorea as a manifestation of rheumatic fever.

The basic therapeutic approach consisted of sedation. A course of intravenous typhoid fever therapy was also given and it was the clinical impression that improvement was noted in both the diminution of the choreiform movements and the stabilization of the emotional complexes. Several days after completion of the fever therapy the patient developed a psychosis with ideas of persecution. She accused ward personnel of making sexual advances, refused to leave the bathroom and was alternately manic and depressive. She was transferred to the neuropsychiatric service where the problem was approached with continuous sedation and therapeutic interviews. An electroencephalogram was not satisfactory but no abnormalities were apparent. With adequate sedation, rest, quiet and periodic interviews the patient showed some improvement and was discharged from the hospital.

Upon her return home and discontinuance of the regular sedation schedule the patient had a recurrence of her previous purposeless extremity movements and wide mood swings. She visited a physician in her community who made a diagnosis of hyperthyroidism and referred her back to this hospital for further study and treatment.

of the vessel walls, but Sealey¹⁵ has successfully operated on a 56 year old male. Although the most desirable age appears to be in the second decade, excellent results are obtainable in the 20 and 30 year age groups. One of our patients who was operated on was 34 years of age, and a good result was obtained. Very young children are also poor subjects because the aorta is small and the collateral vessels are not well developed, adding greatly to the risk of the operation. The possibility of the anastomotic site failing to enlarge with the growth of the child is also a potent deterrent factor. Advanced cardiac enlargement, myocardial damage, and decreased cardiac reserve all add to the risk of operation but after medical management are not contraindications. Hypertension, no matter of what degree, does not disqualify a patient for an operation, although if it is of long standing and in a patient over 20 years old, it certainly will increase the risk because of the changes in the aortic wall which may have resulted.

The results of surgical intervention are dramatic although it may take a month for the blood pressure to return to normal levels. The femoral arterial pulses return to near or normal when the operation has been properly performed. If early diagnosis is made there is little doubt that the patient will be benefited by surgical treatment. The age group of the military services offers a fertile field for discovering patients with coarctation of the aorta who can be benefited by surgical means. Patient 5 was an Army hospital corpsman who had a satisfactory operative result and who has just returned from a two-year tour of combat duty in Korea. He is now four years postoperative. It is firmly believed that those who have this congenital abnormality surgically corrected may be salvaged for continued duty within the service bringing benefit to the government by keeping trained men in their positions and avoiding untold pension costs, as well as bestowing benefits to the patient by freeing him of symptoms and providing for a longer span of life. The average age at death of persons with untreated coarctation of the aorta is 30 to 35 years.

SUMMARY

Thirteen cases of coarctation of the aorta, diagnosed after the patients had undergone a number of physical examinations and, in a few, previous hospitalization illustrate the frequency with which the detection of the abnormality is missed on physical examination.

Diminished pulsations of the femoral arteries, with hypertension in the upper extremities and hypotension in the lower extremities, are of particular diagnostic value.

Early detection and surgical correction are necessary if the patient is to enjoy long life, be symptom free, and is to continue duty in military service.

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Pioneer in Cardiac Physiology

Among the pioneers of the study of the circulation we should also pay our respects to Stephen Hale who in 1733 made casts of the left ventricular cavity and assuming that each stroke emptied it calculated to four figures the cardiac output and the velocity of the blood flow in the aorta and in its branches by dividing the output by the aggregate cross area of the arterial tree at various levels. He located the peripheral resistance—to use modern jargon—in the minute vessels and worked out an explanation for dropsy that needs little extrapolation to seem very modern.

—W F HAMILTON Ph D

C ul t p 527 Oct 1953

CHOREA ASSOCIATED WITH HYPERTHYROIDISM

Review of the Literature and Report of a Case

JAMES C SYNER *Captain MC USA*

PAUL S FANCHER *Colonel MC USA*

JOHN W KEMBLE *Colonel MC USA*

IN the conventional scheme of categorizing varied patterns of involuntary muscular movements of a purposeless to a quasi purposive nature, there is described the so-called extrapyramidal syndromes¹ These are the clinical manifestations of pathologic changes in the corpus striatum and have as a common denominator some form of involuntary muscular movements, particularly of the extremities^{1,2} The extrapyramidal syndromes consist of the following (1) Parkinsonian syndrome, subclassified into (a) paralysis agitans, (b) parkinsonism following encephalitis lethargica, and (c) arteriosclerotic parkinsonism It is characterized by slow, rhythmical movement, muscular rigidity, and tremor (2) Hepatolenticular degeneration, which is a progressive disease of early life, frequently familial, with central nervous system degeneration, cirrhosis of the liver, and increasing muscular rigidity and tremor (3) Torsion dystonia, characterized by involuntary movements producing torsion of the limbs and vertebral columns (4) Spasmodic torticollis, causing a rotated attitude of the head, induced by clonic or tonic contraction of the cervical muscles (5) Athetosis, with involuntary movements which are slower, coarser, and more writhing than choreic movements (6) Chorea, subclassified into Sydenham's, Huntington's, and senile chorea¹

CASE REPORT

This case report illustrates a disease process in which chorea, or choreiform movements, occurred in a patient with severe hyperthyroidism and is of particular interest because of its rarity as well as its value in implicating chorea as a manifestation in conditions other than rheumatic fever

From the Red Army Hospital, Washington, D. C. Capt. Syner was at 48th Surg. Hospital

A 25 year old woman was transferred from another hospital with a diagnosis of chorea cause unknown. She was a German war bride who had been in this country less than one year. Her husband was overseas and she had been increasing nervousness, irritability and unresolved conflict in her social and marital adjustment. Two weeks prior to admission there was an abrupt onset of continuous involuntary flinging movements of the extremities which were more pronounced on her left side. Emotions were labile but no bizarre ideation was expressed. She cried or laughed without apparent cause and she had fallen on several occasions because of the weakness and unsteady gait associated with the purposeless flinging movements.

She had a slightly enlarged thyroid gland and a slight degree of exophthalmos. Her pulse rate varied from 108 to 130 per minute. A soft systolic murmur without radiation (grade I in intensity) was heard in the second left intercostal space.

Routine laboratory data was without significant abnormalities. Sedimentation rate was 8 mm in one hour and remained normal throughout the hospital course. The spinal fluid was normal and the electrocardiogram was also within normal limits.

The hospital course presented a continuation of the choreiform movements and wide mood swings. Consultations were obtained from several specialists all of whom believed that the patient had chorea as a manifestation of rheumatic fever.

The basic therapeutic approach consisted of sedation. A course of intravenous typhoid fever therapy was also given and it was the clinical impression that improvement was noted in both the diminution of the choreiform movements and the stabilization of the emotional complexes. Several days after completion of the fever therapy the patient developed a psychosis with ideas of persecution. She accused ward personnel of making sexual advances, refused to leave the bathroom and was alternately manic and depressive. She was transferred to the neuropsychiatric service where the problem was approached with continuous sedation and therapeutic interviews. An electroencephalogram was not satisfactory but no abnormalities were apparent. With adequate sedation, rest, quiet and periodic interviews the patient showed some improvement and was discharged from the hospital.

Upon her return home and discontinuance of the regular sedation schedule the patient had a recurrence of her previous purposeless extremity movements and wide mood swings. She visited a physician in her community who made a diagnosis of hyperthyroidism and referred her back to this hospital for further study and treatment.

Her basal metabolic rate was plus 86 percent. Radioactive iodine uptake was 86.6 percent. Therapy consisting of propylthiouracil and Lugol's solution was instituted. At the beginning of the therapy the patient was severely toxic. She demonstrated gross tremor, lid lag, extreme irritability, weight loss, nervousness, frequent crying, and her pulse continued around 120 per minute. At the end of the first month of therapy her basal metabolic rate was plus 7 percent, she was cheerful, socialized well with her friends, and her pulse dropped to 76 per minute. The gross tremor of the hands disappeared, her wide mood swings cleared, and she gained 17 pounds.

DISCUSSION

The clinical manifestations of the neuromuscular disorder in this patient meets the established criteria of Sydenham's chorea by reason of (1) its distinctive involuntary movements, (2) movements which are purposeless to quasi-purposive, (3) movements intensified by voluntary effort and by excitement, (4) movements that disappear during a period of sleep, (5) absence of sensory changes with no disturbance of the sphincters, (6) associated presence of a marked emotional instability and a state of excitement which can progress to a distinct maniacal chorea, (7) absence of progressive mental deterioration, and (8) transient nature of the symptoms.²⁻⁵

Huntington's chorea, a hereditary degenerative disease of the nervous system, differs from Sydenham's chorea. Huntington's chorea is characterized by a progression of the symptoms and mental deterioration, and usually appears late in life.^{1, 3, 6, 7} There were no features in this case to suggest this diagnosis.

Recognition of senile chorea should present no difficulty in differentiation from Sydenham's chorea because of the age of the patient, suddenness of onset of symptoms, and its generally unilateral nature.^{1, 3, 10} It may be difficult, however, to differentiate senile chorea from Huntington's chorea.

In evaluation of the etiology of chorea in this study, one of the major factors considered was rheumatic fever. Rheumatic fever as the cause of Sydenham's chorea, especially in childhood, is well documented.^{1, 3-5, 11-16} Unfortunately most of the information on chorea as a manifestation of rheumatic fever applies to the pediatric age group. Kuttner¹⁷ stated that chorea is rare after puberty and never occurs after the age of 20 years in association with rheumatic fever. This is further illustrated in a series of cases analyzed by Jones and Bland¹⁸ who pointed out that chorea in rheumatic fever is rarely seen after adolescence. This point is also indicated in Hedley's¹⁹⁻²¹ series of cases. Jones¹² and Jones and Bland¹⁸ also stressed the im-

portance of a previous history of chorea in establishing the diagnosis of rheumatic fever in adults. Therefore although Jones suggested that chorea is a major manifestation of rheumatic fever this would seem to apply only to a well defined age group and particularly to ages from 7 to 14 years as given by Kuttner with a peak incidence at 8.

There are many other diseases which have been associated with chorea. A review of the literature revealed that chorea has been described in diphtheria, benign tertian malaria, psychic disturbances, murine typhus, measles, scarlet fever, influenza, disseminated lupus erythematosus, syphilis, pregnancy, polycythemia vera, anemia, and chickenpox.¹⁻⁷

Another point of interest in this case was the evaluation of the normal erythrocyte sedimentation rate relative to the diagnosis of rheumatic fever. The elevated sedimentation rate has long been used as an aid in following rheumatic activity. However it is generally accepted that the sedimentation rate is not a specific diagnostic factor but rather a nonspecific finding suggestive of active disease processes. Many authors have pointed out the presence of a normal sedimentation rate in the presence of clinical active rheumatic fever.^{7,8}

Kuttner stated that patients with chorea usually do not have fever, leukocytosis, or a rapid erythrocyte sedimentation rate when rheumatic fever is the causative factor. Jones stated that the sedimentation rate may be normal in active rheumatic fever and that a normal rate in the presence of rheumatic heart failure is frequently found.

Hagan and Mirman analyzed a series of 107 patients for the specific purpose of obtaining further information on the relationship between an increased erythrocyte sedimentation rate in active rheumatic fever versus the normal sedimentation rate in chorea. They studied the difference between patients with chorea who had increased sedimentation rates and those with chorea who had normal sedimentation rates. Of the 107 chorea patients, 88 were seen during the first episode of chorea and 19 were seen for the first time during the second or subsequent episode. Of the 88 patients, 51 had a normal sedimentation rate and not one of these showed any other evidence of rheumatic fever. Fifteen of these patients were observed for from 5 to 11 years and during that time none developed rheumatic fever. The remaining 37 patients had an increased sedimentation rate, 19 had active rheumatic heart disease, 12 showed other evidence of rheumatic fever, and 6 had no other evidence of rheumatic fever. The authors concluded that chorea associated with an increased erythrocyte sedimentation rate is in most instances a manifestation of active rheumatic fever. It was their opinion that patients who had a normal sedimentation

rate during their first episode of chorea did not have rheumatic fever. In this nonrheumatic chorea group it was shown that psychogenic factors were far more numerous and varied than in the patient with rheumatic chorea. On detailed case analysis they implicated a temporal relationship between the onset of the choreic episode and the striking nature of certain psychogenic factors. This emphasized the probable etiologic role of psychic disturbance in chorea.

Information on the independence of chorea and rheumatic fever is not new and is supported by other workers. In 71 patients with chorea, Johnston⁷ found 59 percent without other evidence of rheumatic fever. Sutton and Dodge¹⁰ reported on 466 choreic patients in whom 52 percent had no other evidence of rheumatic fever. Coburn and Moore,¹¹ reporting on 137 hospitalized choreic patients, noted that 49.7 percent were without other evidence of rheumatic fever. Parrish and colleagues¹² reported on 112 choreics in whom 69.7 percent had no other evidence of rheumatic fever. In the Gerstley et al.¹³ series of 150 patients with chorea, 86.7 percent were without other evidence of rheumatic fever.

The problem of effect of chorea on the basal metabolic rate must be considered. Lueth¹⁴ studied 42 patients with acute Sydenham's chorea and found the basal metabolic rate in each patient to be normal. He further pointed out that the severity of chorea apparently did not effect the metabolic rate. Gerstley¹⁴ studied this problem and found in his series of cases that the basal metabolic rate was within normal limits.

In a review of the literature and a number of standard textbooks on neurology and endocrinology, only slight reference was made to the association of chorea in hyperthyroidism. Brain,¹ in his discussion on the etiology of chorea, mentions that thyrotoxicosis is a rare cause of the syndrome. Lueth described a patient with irregular tremor, tachycardia, soft systolic murmur over the apex of her heart, moderate pyrexia, slight loss of weight, and irritability, in whom it was difficult to distinguish between an acute rheumatic chorea and a thyrotoxicosis. He stated that other patients have been observed where this differential diagnosis arises. Bing¹⁵ observed choreiform movements in one patient with thyrotoxicosis but stated that he considered them to be "nothing more than an exaggerated form of psychomotor restlessness."

SUMMARY

An associated chorea may mask or delay the recognition of clinical hyperthyroidism. Such a case associated with severe thyrotoxicosis is reported. This patient had none of the manifestations of acute rheumatic fever or rheumatic heart disease.

and was similar to those described by Hagan and Mirman.²² His analysis suggested that patients who had a normal sedimentation rate during their first episode of chorea did not have rheumatic fever. In the nonrheumatic chorea, psychogenic factors were far more numerous and varied than in the cases of rheumatic chorea. The persistent normal erythrocyte sedimentation rate and associated psychogenic features suggest a nonrheumatic cause. Evidence that a normal basal metabolic rate is the rule in Sydenham's chorea is found in Lueth's study. A diagnosis of thyrotoxicosis was well established in our patient by clinical and laboratory findings and the patient showed a prompt response to propylthiouracil and Lugol's solution.

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The physician had best avoid telling his patient to stop worrying. The patient would be only too happy to do this if he could. He cannot do it voluntarily, and many patients will resent such advice from family friends or physician.

—HARRY P. LAUGHLIN, M.D.

in *Medical Annals of the District of Columbia* p 472 Sept 1953

TYPHOID FEVER EPIDEMIC INVOLVING IMMUNIZED SOLDIERS

ALI HHSAN BALIM M D

CHRISTIAN GRONBECK J L ut a t Colo t MC USA

SCATTERED cases of typhoid fever in previously immunized personnel have been reported by Hodgson Tullis Syverton and associates and Rosenblum ¹ The largest single outbreak reported is that of Syverton and associates with 24 cases and Rosenblum with 17 cases from the same outbreak which were reported separately The source of the infection was not definitely ascertained in these series and the pattern of cases both geographically and in time was of an endemic rather than epidemic type The present series of 112 cases is considered worth reporting because of its size and typical epidemic form

All cases occurred in Turkish army personnel members of one regiment stationed in the same camp in eastern Turkey All patients were hospitalized between 8 September 1952 and 2 October 1952 Fifty of the 112 patients were treated at one military hospital on the service of one of us (A I B) Detailed information on the other 62 patients is not available to us so this report will be confined to the 50 patients observed In general the 112 patients followed the same pattern of disease treatment and results There were no deaths

The regiment involved in this epidemic was stationed in a rural isolated area in rather crowded barracks Typhoid was endemic among the civilian population A small stream flowing through the camp was used for drinking water The epidemic is presumed to have started by carrier contamination of this stream One soldier returned from leave on 22 August 15 days before the start of the epidemic In an investigation into the cause of the epidemic this soldier was found by stool culture to be a typhoid carrier and it was then learned that he had had prolonged fever and had been treated with chloramphenicol during

F m Duml Turk h Army H p l Y l Turk y Col G b k Surgeo 28th
I f ry D n

his leave. He is assumed to be the source of the water contamination but this is not certain because 50 other typhoid carriers, who had evidently been carriers for months and years, were discovered in the regiment during the investigation. Forty of these were cured of their carrier state by a combination of sulfanilamide

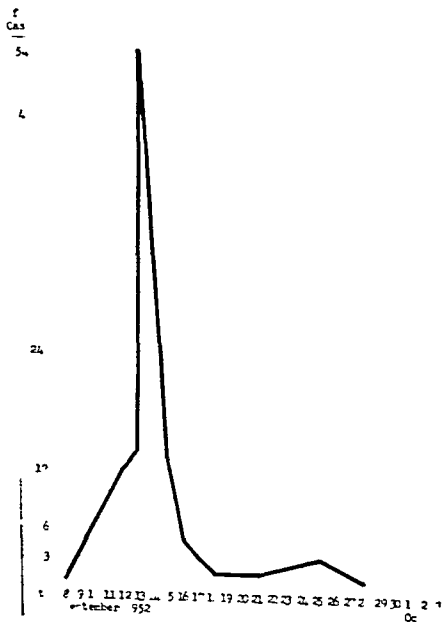


Figure 1. Time distribution of occurrence of typhoid fever among the troops.

or sulfaguanidine and chloramphenicol. The ten who remained carriers were segregated. The time distribution of the cases indicates a water or food source (fig 1), but food as the source is unlikely because the cases occurred simultaneously in companies with different kitchens.

On entering military service all Turkish soldiers are inoculated against typhoid typhus and smallpox. A mixed typhoid typhus vaccine containing 500,000,000 typhoid bacilli and 250,000,000 each of paratyphoid A and B per cc of vaccine prepared in Turkish government laboratories, is used. A course of immunization consists of inoculation of 0.5 cc of the vaccine initially and 1 cc a week later. The U S Army vaccine contains 1,000,000,000 bacteria per cc and the initial course is three inoculations of 0.5 cc each. This gives a total of the same number of bacteria as in the Turkish method. After the epidemic samples of the vaccine used to immunize these soldiers were recalled for examination. The vaccine was found to be sterile and to contain the proper number of bacteria per cc.

The diagnosis was established in all patients by a characteristic clinical picture confirmed by a positive Widal reaction in dilutions greater than 1:200. Cultures were not done routinely because laboratory facilities were limited.

Most patients were observed in the hospital for a day or two before treatment was started but a few seriously ill patients in whom the diagnosis was clear were treated on admission. All patients with uncomplicated disease were given 2 grams of chloramphenicol orally the first day and 1 gram daily thereafter in divided doses. This was continued for a minimum of four days or until temperature had been normal for 24 hours and signs and symptoms of the disease had disappeared. These patients can be subdivided into several groups according to their response to treatment primarily based on duration of fever and clinical signs and symptoms after start of treatment.

GROUP 1

Eight patients became afebrile and almost asymptomatic within 24 hours. Clinically these patients were as sick as those in the other groups on admission and did not differ significantly in the duration of illness prior to treatment, date of immunization or method of treatment. They were given an initial dose of 750 mg of chloramphenicol followed by 500 mg every six hours. Twenty-four hours later temperature was normal and remained normal thereafter. Coincident with the drop in temperature the patients became alert and felt better. Chloramphenicol 1 gram daily was continued for an additional three days. Convalescence was uneventful. Figure 2 illustrates the response of this group to drug therapy.

GROUP 2

This group of 32 patients was the largest and their illness followed the pattern of those treated with chloramphenicol reported in the literature.² In these patients the temperature

dropped to normal by lysis in from 48 to 96 hours after the start of drug therapy. Clinical improvement was apparent after the first 36 hours.

Convalescence was uneventful in 22 patients of this group. The remaining 10 had one or more relapses*. It was impossible to

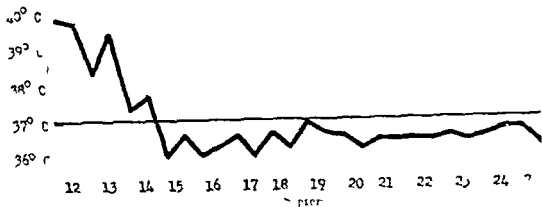


Figure 2. Temperature chart of a patient in group 1

predict from the original clinical condition which patient would have a relapse. Five patients had one, three had two, and two had three relapses. When this occurred the patient responded to chloramphenicol as well as he did in the initial disease.

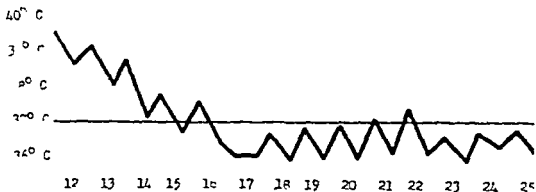


Figure 3. A typical temperature chart of a group 2 patient without complications.

Figure 3 illustrates the temperature response of most patients in this group. Figure 4 is representative of the response of patients who had relapses.

GROUP 3

Group 3 includes three patients who showed little improvement until the fifth day of therapy (fig 5) despite the fact that 2 grams

*EDITORS' NOTE: A. T. John and V. S. Vinayagam in *Lancet* 2: 757-759, 18 Oct. 1952, reported that interrupted courses of chloramphenicol greatly reduced the relapse rate in patients with typhoid fever.

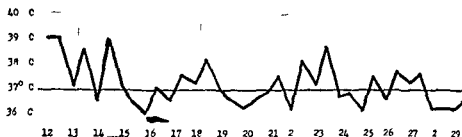


Figure 4. A temperature chart of a group of 2 patients who had laps

of chloramphenicol were given daily for 4 days and then reduced to 1 gram. In one patient this course might be attributed to faulty absorption of chloramphenicol because of the severe diarrhea.

GROUP 4

The three patients in group 4 are considered separately because they presented an unusual picture of a diffuse exanthem, although based on the duration of fever they belong in group 3. The lesions of the diffuse exanthem were typical rose spots which were so numerous as to form a generalized rash, most dense over the chest and abdomen and confluent in spots. Individual lesions were from 1 to 3 mm in diameter, pink in color, flat, round, and did not blanch on pressure. In one patient the rose spots ulcerated and became secondarily infected to form a generalized pustular rash, not unlike chickenpox or smallpox. The patients responded to drug therapy; the rash faded and convalescence was uneventful.

GROUP 5

Four of the 50 patients developed one of the following complications: bowel perforation with peritonitis, toxic meningitis, thrombophlebitis, or lobar pneumonia.

The patient with peritonitis was given 3 grams of chloramphenicol, 2 grams of streptomycin, and 600,000 units of penicillin.

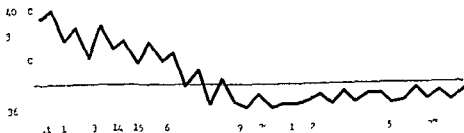


Figure 5. Temperature chart of a patient in group 3.

daily Pentylenetetrazol was given every four hours for circulatory support and from 2 000 to 3,000 cc of normal saline were given intravenously daily for the first two days. After 24 hours, his general condition improved and vomiting decreased. Treatment was continued, and by the seventh day his temperature was normal, the leukocyte count was 6,200, his abdomen was soft and nontender, and he was alert, resting comfortably, and hungry. Chloramphenicol dosage was dropped to 1 gram daily. Improvement continued and on the thirteenth day all antibiotics were discontinued. The patient convalesced rapidly and he was returned to duty. Stool culture was positive for *Salmonella typhosa* on the eleventh day.

Spinal fluid findings in the patient with toxic meningitis were normal, but because of the severity of his symptoms he was given an initial dose of 600,000 units of penicillin and 6 grams of sulfadiazine daily. The next day he was given an initial dose of

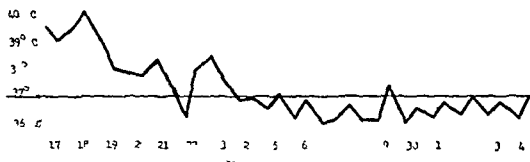


Figure 6. Temperature chart of patient in group 5 with typhoid fever and toxic meningitis.

4 grams of chloramphenicol followed by 3 grams daily in divided doses. He continued to be disoriented and became opisthotonic. After 48 hours of chloramphenicol treatment with no improvement 2 grams of streptomycin daily was started.

Twenty four hours later (four days after admission), his temperature dropped below 38° C for the first time, but he remained semicomatose and at times, disoriented. He had several convulsive seizures affecting only the face. These were characterized by fixation of the eyes and spastic contortion of the facial muscles. Rectal chloral hydrate was used successfully for relaxation during these episodes. Projectile vomiting ceased on the sixth hospital day. By the eighth hospital day general improvement was apparent, and from then on his condition cleared and his stiff neck, vomiting and oculogyric crises diminished. On the tenth day streptomycin and chloramphenicol dosages were reduced to 1 gram daily and penicillin was discontinued. The leukocyte count was then 7,200. All medication

was discontinued after 12 days and he made an uneventful recovery (fig 6)

The third patient in this group responded to chloramphenicol and after 48 hours was afebrile and asymptomatic. Treatment was discontinued after three days. On the seventh day he complained of pain in the left calf which on examination was found to be 2.5 cm larger than the right and tender on palpation. The leg was immobilized and only symptomatic treatment was given. All symptoms and signs disappeared after three days and the patient returned to duty.

The patient with typhoid fever complicated by lobar pneumonia was initially given 600 000 units of penicillin daily and 2 grams of chloramphenicol the first day and 1 gram daily thereafter. Temperature returned to normal in 48 hours and all symptoms cleared by the fourth day. Treatment was discontinued. Physical signs of pneumonia gradually disappeared and the chest was clear by the tenth day.

DISCUSSION

The rarity of typhoid fever in the United States and among United States military personnel in other parts of the world is the result of personal hygiene and sanitation and compulsory immunization of military personnel. This report again emphasizes the importance of the former factor. This epidemic would have been prevented by even the most rudimentary sanitation measures. It was not prevented by immunization.

The small dosage level and short course of chloramphenicol used in the treatment of these patients was necessitated by the shortage and cost of the drug in Turkey. The experience obtained here by virtue of necessity may add to the knowledge of the use of this drug in typhoid fever and be of service in similar situations elsewhere.

Laboratory testing of these patients was minimal because of limited facilities and personnel but is believed sufficient because of the epidemic character of the outbreak and the clinical findings.

From a treatment point of view the general results were excellent with very small amounts of chloramphenicol. Ten patients each received an average of 5 grams, 22.7 grams and six 12 grams. All of these made an uneventful recovery. This group includes two of the complicated cases, the pneumonia and the thrombophlebitis. The 10 patients who had relapses each received an average of 12 grams but the initial response was achieved with an average of 6 grams. It is reasonable to assume that the relapses would not have occurred if treatment had been continued.

at the 1 gram daily level for another five to six days a total course of 10 days.⁷ In other words 48 of the 50 patients in this series would have been cured with a course of 2 grams the first day and 1 gram daily for 10 days. The remaining two patients cannot be considered in this respect because they had severe complications requiring special management.

The effectiveness of this dosage level is indicated by the fact that no deaths occurred in this series. The mortality rate of patients with typhoid was 10 percent before chloramphenicol came into use according to statistics from the Preventive Medicine Section, Turkish General Staff.

The effect of previous immunization cannot be determined from this series but it probably was a factor.⁸ All patients in this series had a positive Widal test in 1:200 or greater dilution within the first two weeks of the disease. In unimmunized persons this level would not be expected until the second to fifth week of the disease.⁹ Because the cure of a patient with typhoid fever is dependent on the development of his immunity, an early rise in the antibody titer of the patient is important. Chloramphenicol carries out its bacteriostatic role while this titer in the host rises. The histories of the patients who had relapses, however, indicate clearly that immunization alone would not have prevented the prolonged febrile course characteristic of the untreated disease. We therefore postulate that a maximal drug effect of chloramphenicol in the patient with uncomplicated typhoid fever can be achieved with doses of 0.5 gram every six hours for the first day and 1 gram daily thereafter. The relapse rate is related to the duration of drug therapy rather than to the drug level.

SUMMARY AND CONCLUSIONS

An apparently water borne epidemic of typhoid fever involving 112 patients occurred in a Turkish army camp. Fifty of these patients who were treated in one hospital and had been vaccinated against typhoid fever during the previous year were reported in some detail. During the epidemiologic investigation 50 typhoid carriers were found. Forty of these were cured by drug therapy.

Forty eight patients were treated with chloramphenicol 2 grams the first day and 1 gram daily thereafter. Therapy was continued for two days after temperature became normal. This therapy was uniformly successful initially but 10 of the 48 patients had one or more relapses. Patients who had a relapse responded as well to chloramphenicol as they did in the initial illness. There was no evidence of drug resistance or drug toxicity.

We believe that a course of 2 grams of chloramphenicol the first day and 1 gram daily for 10 days would have achieved optimal results in 48 of the 50 patients presented.

Two patients who were seriously ill because of complications when first seen required additional drug therapy. All patients recovered without sequelae.

Compulsory immunization alone will not prevent epidemic typhoid fever.

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National Science Foundation Announces Awards

The National Science Foundation has announced 123 awards totaling about \$1 332 000 for research in the biological and the physical sciences and to support studies and conferences on science scientific information exchange compilation of scientific personnel information and travel of American scientists to international scientific meetings.

This is the first group of awards to be made during fiscal year 1954 by the Foundation for the support of basic research and related matters. Since the beginning of the program in 1950 over 525 such awards have been made totaling about \$4 967 000. Additional proposals are being evaluated by the staff of the Foundation with the help of advisory panels of outstanding American scientists.

INTESTINAL PARASITIC INFECTIONS IN MILITARY FOOD HANDLERS

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DURING a 16 month period stool specimens from 1,500 military food handlers were examined for parasites at this laboratory. The food handlers were from three sources. The largest number was from Army, Air Force, and Marine Corps personnel attending the Food Service School at the Presidio of San Francisco, the next largest group consisted of personnel assigned to the various messes at the Presidio and its sub-posts, and the smallest group were personnel assigned to messes at Fort Ord, Calif. About 83 percent of those examined were in the Army because the Marine Corps, and later the Air Force, discontinued sending personnel to the Food Service School at the Presidio.

Procedure

A single specimen was obtained from each person. All specimens were examined by direct and concentration methods and, in addition, those specimens showing protozoa were stained with one of the temporary stains and with tergitol iron hematoxylin.

Results

The results of the examinations made on the personnel of the three services are given in table 1. An insufficient number of Marines were examined to be of significance. The incidence of infection in the Air Force personnel showed strikingly different percentages from that found in Army personnel. Air Force personnel had twice the incidence of *Endamoeba histolytica* (6.7 vs 3.4 percent), over twice the incidence of hookworm (6.1 vs 2.5 percent), ten times the incidence of *Hymenolepis nana* (2.4 vs 0.24 percent), and a greater percent of total helminth infections (10.9 vs 6.0 percent). Army personnel led in infections with *Ascaris lumbricoides* and *Trichuris trichiura* (3.0 vs 1.8 percent).

From 58th Army Medical Laboratory, Fort Belvoir, Calif.

TABLE 1 Incidence of psychiatric military diseases

P	Army		Air Force		Navy		Total	
	A P	T P	A P	T I	A P	T P	A P	T P
Edm b b st lyt	34	82	67	163	11	27	36	87
Edm b l	169	325	266	512	214	412	183	352
Edl max ana	148	285	242	465	169	325	159	306
Edm b b t bl	11	21	12	23	11	21	11	21
D t m b f g l	32	61	12	23			40	77
Chl m t m l	40						33	
Trcb m b m	08						07	
G d a l mbl a	50		97		90		57	
H lm th	604		109		11			
H kw m	(25)		(61)		(11)		28	
A ars								
I mbr d	(48)						40	
St gyl d	(32)						33	
st ral								
Trn h n	(25)		(18)				23	
t h	(24)		(24)				47	
Hym l p na								
Number m d	1246		165		89		1500	
A P = A	P		R		T P = Th		Type	

Information was not available concerning foreign service of the food handlers or their total length of military service. However, the grades of most of them were available and were used as a rough guide to their length of service. The enlisted men were divided into three groups (a) privates (E 1,2), who generally have had little military service and relatively few of whom have served overseas, (b) privates first class (E 3) and corporals (E 4), who generally have had longer service and more of whom have served overseas, and (c) sergeants (E 5) sergeants first class (E 6), and master sergeants (E 7), the majority of whom have had overseas service and whose military service generally dates back at least to the time of World War II. Incidences of the various infections in these three groups of enlisted men are given in table 2. Omitted from the table are 13 enlisted men whose grades were not obtained, and 21 officers and warrant officers. Due to the smaller number of personnel examined, similar tables for the Air Force and the Marine Corps would not be statistically valuable.

In tabulating the results according to the grade structure given above, several observations were made. The incidence of infection with *E. histolytica* was close in the three groups, ranging from 3.3 to 3.7 percent, but the incidence of the helminth infection showed an increase with length of service and the incidence for total helminth infection in the three groups increased from 3.5 percent (E 1-2) to 6.4 percent (E 3, 4) to 11.9 percent (E 5-6 and 7). Thus, the intermediate grades had almost twice the percent incidence of helminth infection as the lower grades, and the upper three grades had about 3.5 times the percent incidence of the lower grades. Of the 277 men in the upper three grades, 31 men (11.2 percent) harbored pathogenic species (*E. histolytica* and the helminths), of these, 22 had a single pathogenic species, eight had two pathogenic species each, and one had three pathogenic species.

In both tables 1 and 2 the theoretical percentages of infection with the various species of amoebae are computed on the basis of data obtained by Sawitz and Faust.¹ According to their data, a single specimen per person, examined by direct, concentration, and staining techniques, would show only 41 percent of the infections with *E. histolytica* and only 12 percent of the non-pathogenic amoeba infections. All personnel in this survey found to have pathogenic species were treated or had a letter sent to their home station, stating what parasites were found.

Discussion

Three surveys have been made on naval personnel,²⁻⁴ one on marines,⁵ and four on Army personnel.⁶⁻⁹ With the exception

TABLE 2 I c d / p t h o g c t i l p c i t e n A r m y l t d m e a c d e t o g r a d

G d	P u	E 1 2		E 3 4		E 5 6 7	
		A P	T P	A P	T P	A P	T P
E d a m b a h s t o l y t a		3 4	8 2	3 7	9 0	3 3	8 0
E d a m b a l		1 6 8	3 2 3	1 9 3	3 7 1	1 4 8	2 8 5
E d l m a x a		1 2 7	2 4 4	1 6 2	3 1 1	1 6 6	3 1 9
l d a m b a b u t c h l i		3	6	2 0	3 8	1 1	2 1
D t m b a f a g l		2	4			7	1 3
C h l m t i x m s l		5		3		4	
T c h m a h o m		2					
G d a l a m b l		3 8		6 5		6 1	
H e l m n t h		3 5		6 4		1 1 9	
I l o k w r m		(2 1)		(2 6)		(3 6)	
A a n							
l m b r i c d s				(9)		(1 1)	
S t r o n g l d							
i r l i		(2)		(3)		(7)	
T r i b n s							
i b		(1 0)		(2 3)		(6 1)	
H y m l p a		(2)		(3)		(4)	
N m b e m u n d		5 8 2		3 5 3		2 7 7	
A P = A u l p		R T P = T		I p		s	

of the Marines⁵ and those made by Tatsuno and Bushnell⁶ and Kraus,⁷ the other surveys were made during or immediately after World War II and several included only those with overseas service.^{2, 3, 7}

TABLE 3 Incidence of helminth infection in military personnel compared with that estimated for the general U S population

Parasite	U S population	Military personnel
Hookworm	1.27	7.65
<i>Ascaris lumbricoides</i>	2.11	27
<i>Strongyloides stercoralis</i>	.28	61
<i>Trichuris trichiura</i>	28	1.43
<i>Hymenolepis nana</i>	.08	29
<i>Taenia saginata</i> and <i>Taenia solium</i>	.08	.04
Total	4.10	10.29

Stoll made an estimate of the numbers of people in the world infected with the various species of helminths. Estimates were given also for the various geographical areas. North America included the United States and Canada, but not Mexico and the Caribbean. The majority of infections listed for North America naturally fall in the United States. In table 3 the estimated incidence of the various infections in the United States population is given, based on the figures from Stoll and the estimated population at the time his article was written. For comparison with these, the incidence computed from the combined surveys of military personnel (discussed in references 2, 7 and in this survey) a total of 10,499 servicemen, is given. From this table it is evident that the incidence of helminth infection in military personnel is about two and one half times that in the general population. Only in the cases of *A. lumbricoides* and *Taenia saginata* and *Taenia solium* does the civilian population show a higher incidence. However, ascaris is primarily a childhood infection and relatively few adults of the general population of military age harbor this species.¹ Military personnel had about six times the incidence of hookworm over twice the incidence of *Strongyloides stercoralis* over five times the incidence of *T. trichiura* and nearly four times the incidence of *H. nana*. In addition to the species given in table 3, infections of *Schistosoma japonicum* and *Fasciolopsis buski* occurred in some personnel examined.⁷

Although this survey was made on a group of military food handlers there is no evidence that the incidence of infection varies greatly from that in other military personnel, because many had been assigned recently as food handlers and also examinations made on servicemen who are not food handlers follow the incidence closely

This would indicate that military service leads to an increase in parasitic infections and probably more so in those having had overseas service. The various surveys which have been made indicate that over 10 percent of military personnel harbor *E. histolytica* or various helminth infections for which they should be treated.

Summary

Fifteen hundred military food handlers were examined for intestinal parasites and 10 percent were found to harbor pathogenic species. The incidence found in Air Force personnel was higher than that found in Army or Marine Corps personnel. Army enlisted men in the higher grades who probably had more overseas service showed a higher incidence than those in the lower grades who probably did not have overseas service. Military personnel have a higher incidence for nearly all helminth infections than do civilians in the United States.

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P h i l d l p h P 1951 p 384

THE UNRELIABILITY OF THE RICHARDSON CHEMICAL TEST FOR PREGNANCY

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WALTER G LEONARD Jr *Lieutenant MC USN*

IN 1951, Richardson¹ reported a chemical test for pregnancy and claimed 99.1 percent accuracy in over 2,500 tests. The test was proposed for office or clinic practice because it could be completed in half an hour and required only a limited number of reagents. It appeared to satisfy the requirements for a simple but accurate, rapid, and inexpensive test.

The test was described as having two components. The primary test was alleged to demonstrate colorimetrically the presence of free estrone in the urine of a pregnant woman. The appearance of a definite color following simple extraction of the estrone and reaction with 2,4 dinitrophenylhydrazine was considered a positive test. For this particular reaction claims of high accuracy were made. The secondary test also had a colorimetric end point, the extracted estrone combining with meta dinitrobenzene. This test was admitted to be less accurate, and Richardson mentioned instances where false reactions followed certain medications. He reported it as only a confirmatory test, not to be regarded as necessarily reliable.

CLINICAL EVALUATION

In order to definitely evaluate the Richardson test, a study was projected to include adequate data and controls. The urine specimens used were from definitely pregnant women attending our prenatal clinic and from proven nonpregnant female patients at the outpatient clinic. In addition, some specimens were sent from outlying activities to provide unknowns. The frog test for pregnancy was employed simultaneously with the chemical tests for many of this latter group. In all cases, the presence or absence of pregnancy at the time the test was performed was confirmed by physical examination and follow up studies.

¹ From the U S Naval Hospital Chelsea Mass Lt Roth now serving on the U S S J near.

TABLE 1 *Results obtained with the primary test for pregnancy employing 24 d it ph ylbyd az n*

Number of subjects	Type	Number of positive	Number of negative	Percentage of error
122	Pregnant	118	4	3.3
78	Nonpregnant	34	44	43.6

Specimens from 200 subjects were tested and the results are shown in tables 1 and 2. Early in the study, it became evident that an excessively high proportion of false results were being obtained particularly false positive reactions. With pregnant women we obtained false negative results in 3.3 percent with the primary test and in 9.8 percent with the confirmatory test. These results might approximate those obtained in average laboratories with the Friedman and frog tests for pregnancy. On the other hand with nonpregnant women, we found false positive results in 43.6 percent with the primary test and in 74.3 percent with the confirmatory test. Thus, while a negative result is probably as reliable as with other accepted pregnancy tests, a positive result is so unreliable as to render the test valueless.

TABLE 2 *Results obtained with the confirmatory test for pregnancy employing meta d nitrobenz e*

Number of subjects	Type	Number of positive	Number of negative	Percentage of error
122	Pregnant	110	12	9.8
78	Nonpregnant	57	21	74.3

COMMENTS

Fischer and McColgan carried out a spectroscopic evaluation of this colorimetric test in a series of 302 patients. Collecting two specimens on consecutive mornings from each patient, their over-all incidence of error was 53 percent. In only 195 cases could the results be duplicated from the two specimens. These investigators explored the false positive tests and demonstrated that pyruvic acid in the urine produces such a reaction. When the pyruvic acid was removed by the Eister procedure, the tests became negative. Thus, any person who has recently exercised might have a false positive test from the presence in the urine of this intermediary metabolite. Solutions of pure estrone were also tested and these produced a positive reaction. The absorp-

tion curve of the pure estrone, however, was not identical with the curve obtained from the urine of known pregnant women. This is an indication that the basis of the positive test is not necessarily free estrone as Richardson claimed.

Even greater doubt is cast on the tests by the report of Stummel,³ in which it is restated that the established tests for estrone (Kuber and Zimmerman) do not give a positive result on urine until the tenth week of gestation or later. This is not compatible with the claim for positive tests in pregnancy prior to the first missed menstruation. Stummel noted that the major portion of the urinary estrone remains in the chloroform fraction that Richardson discards in his extraction process. The aqueous fraction that Richardson tests contains large amounts of androgens, which, like estrone, combine with the reagents to give the same colorimetric response.

These two reports indicate that the colorimetric reaction involves not only estrone, but also substances such as androgens, other steroids with a phenolic group, pyruvic acid, and other organic acids and phenols with a ketone or aldehyde group. The pH at which the reactions occur is of significance, another factor not satisfactorily considered in the Richardson test.

SUMMARY

The Richardson chemical tests for pregnancy were evaluated by testing urine specimens from 122 women proved to be pregnant and from 76 women proved to be nonpregnant. False positive results were obtained in 43.6 percent of the nonpregnant group with the primary test and in 74.3 percent with the confirmatory test. False negative results were obtained in 3.3 percent of the pregnant group with the primary test and in 9.6 percent with the confirmatory test. As presently described, the tests must be regarded as inaccurate, unreliable, and not clinically useful.

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PURULENT URETHRITIS

A Study of 257 Cases

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FOR the past year the venereal disease control section at this hospital in Western Germany has been restudying the problems of proper diagnosis and treatment of urethral discharges particularly nongonorrheal urethritis

We have attempted to exclude all cases of urethritis due to alcohol trauma or chemical irritants Infestation with *Trichomonas vaginalis* did not seem to be a major cause of purulent urethritis in the patients studied here Excluding urethritis due to these causes, we have carefully followed 257 patients with persistent purulent urethritis until they were free of symptoms and discharge

METHODS

All patients were carefully questioned as to the date of onset of symptoms date of last sexual intercourse the relationship of the discharge to alcoholic intake the presence or absence of urinary symptoms the previous history of urethral discharge, and the method of prophylaxis Smears of the urethral discharges stained by the Gram method were made daily for three days before any treatment was begun, unless *Neisseria gonorrhoeae* was identified positively Cultures of the discharges were grown on thiolglycollate blood agar, and on chocolate agar under CO₂

One hundred and sixteen (44 percent) of our cases proved to be gonorrheal urethritis These patients were given 300 000 units of aqueous penicillin daily for three days with prompt subsidence of symptoms and urethral discharge Two of these patients had a recurrence of urethral discharge due to *N gonorrhoeae* within a week but it cleared completely when treatment was resumed with sulfadiazine Both patients denied sexual exposure in the interim There were two cases of urticaria presumably due to treatment with penicillin and one case of gonorrheal arthritis in this group of patients We were treating 60 percent of these patients for the initial occurrence of urethral discharge

F m U S A r F H p I Rh /Ma A B G m a y

The remaining 141 cases (56 percent) in our series were classified as nongonorrheal urethritis. These cases were similar in most respects to the cases described by Graham.¹

We were unable to identify any pathologic organism either by smear or culture which could be incriminated as the cause. Diphtheroids along with other surface contaminants were frequently found. Gram negative rods were grown in abundance, and gram positive cocci and diplococci were grown in some cultures.

TREATMENT

Response to treatment in this group of nongonorrheal urethritis differed from Graham's results. The most important aspects of treatment were abstinence from sexual intercourse and alcohol, avoidance of urethral manipulation, and the maintenance of immaculate personal hygiene. With this regimen alone, 36 patients (26 percent) with nongonorrheal urethritis were symptom free within 48 hours without the use of antibacterial agents.

Because a persistent nongonorrheal urethral discharge developed while several patients were receiving penicillin for gonorrhea, we decided to treat 15 others with nongonorrheal urethritis with penicillin. Six of the patients in this group apparently responded to penicillin in doses of 300,000 units daily for three days. The remaining nine patients who did not respond to penicillin were treated with sulfadiazine with subsequent relief of symptoms.

Ninety of the patients with nongonorrheal urethritis were given sulfadiazine, sulfisoxazole (gantrisin), aureomycin, or methenamine mandelate (mandelamine). Chloramphenicol was not used in treating any of our patients because of the reports of aplastic anemia resulting from its use.^{2,3} In all patients with persistent purulent nongonorrheal urethritis we were able to obtain relief of symptoms and subsidence of discharge if we used these drugs in conjunction with repeated prostate massages, and sitz baths when indicated. All observers agreed that the use of an antibacterial agent hastened the subsidence of symptoms. In our experience sulfadiazine seemed to give the fastest and most satisfactory results. Aureomycin, sulfisoxazole, and methenamine mandelate gave promising results but the total number of patients treated with them was too small to evaluate their true worth. In a recent report Crouch and his associates in the Far East obtained best results with aureomycin.

Seventy-two percent of the 141 patients with nongonorrheal urethritis had no previous history of urethral discharge. This may account for the encouraging results of treatment. It is diffi-

cult to determine whether or not a given case of urethral discharge is a recurrence or a new infection. Treatment is more discouraging in those patients who have had more than one episode of urethral discharge during a short period of time. Even though we were able to obtain a history of sexual exposure in all of our patients with nongonorrheal urethritis we do not believe that nongonorrheal urethritis is primarily a true venereal disease for it has been seen frequently at this station when no positive history of exposure could be obtained. Our knowledge of the pathogenesis of the nongonorrheal urethral discharge is incomplete and many factors have yet to be evaluated.

About 36 percent of both the gonorrheal and the nongonorrheal urethritis patients used either intraurethral prophylaxis after intercourse or a condom or both but developed urethral discharge despite these precautions. This apparent high failure rate for readily available prophylaxis methods is indeed discouraging.

SUMMARY

Two hundred and fifty seven patients with purulent urethritis have been studied. Of these 44 percent had gonorrhea. They responded well to penicillin therapy. The urethritis in 56 percent was nongonorrheal in origin, and the patients responded to various drugs when used in conjunction with prostate massage and sitz baths. Good therapeutic results did not occur unless the patient abstained from sexual intercourse, urethral manipulation, and alcohol during the course of treatment. Sulfadiazine was the most effective drug in the treatment of nongonorrheal urethritis in this series. Although a history of sexual exposure was obtained in all our patients with nongonorrheal urethritis, it is stressed that nongonorrheal urethritis also occurs when no such clear cut history can be obtained. About 36 percent of the patients in both groups developed urethritis despite apparently adequate attempts at prophylaxis at the time of exposure.

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SPEECH CORRECTION SERVICE

LOIS B SENFT M A

ARAM GLORIG M D

IT is recognized that a person with defective speech is in need of special therapeutic assistance. Because a wide range of speech difficulties is encountered among personnel of the armed services, it has been necessary to establish a center, the purpose of which is to assist any person who has a speech dysfunction so that he may perform his service duties with greater efficiency.

There was no single center for audiology and speech correction until 1946. During World War II, several large Army hospitals provided therapy for patients with brain injuries, speech prostheses when required, and psychotherapy for stutterers, but no unit for the specific treatment of speech disorders was organized. After the war, a specific division designated as the Audiology and Speech Correction Center was established at this hospital. Although at first the case load of the center was comprised almost entirely of patients who had difficulty hearing, it soon became known that the rehabilitation services encompassed patients with aphonia, dysphonia, cleft palate, stuttering, dysarthria, articulatory defects, delayed speech, cerebral palsy, or brain injuries, and those who had had a laryngectomy or glossectomy. Increasing numbers of patients were referred to the speech correction section from other hospitals and from the medical facility of the Veterans Administration and the Federal Security Agency. From 1 January 1948 to 31 December 1952, 3,414 patients were treated in the speech correction section. The types of cases examined and treated are summarized in table 1.

ORGANIZATION

A staff of professional and secretarial personnel conduct the program at the center. The professional members include two otologists, one clinical psychologist, a social worker, seven audiometricians and acoustic specialists, three auditory training therapists, five speech reading specialists, four speech pathologists, and one electrical engineer. After receiving a complete

From Walter Reed Army Hospital, Washington, D. C.

physical examination all patients are individually interviewed and examined by a clinical psychologist and given a hearing evaluation and speech appraisal Weekly staff conferences allow for the co-ordinated discussion of the findings on each patient subsequent referrals are made to the appropriate service of the hospital when indicated

TABLE 1 Pat i t t d t th p b rr t ct from
1948 thr gb 1952

D g o o p o g m	Numb f pat t
Spee h i ur nce for pati nt wh hav d ff lty h g	2 581
D f tte t c l t i i pat n who h d ff c lty n h r g	275
Othe t l t i pr bl ms	13
L rying ctomy	99
Aph	155
Del yed pe h ch ldre	58
Ch ld e with ce b l p l y	5
St t t ers	113
Dy ph n -aphon	87
Cl ft p l t in h ld en nd ad lcs	26
Gl t my	2
T t l	3 414

The speech clinic is equipped with amplification aids recording machines and playback sets for stimulating the patients demonstrating progress and keeping permanent records for research and teaching Other equipment includes gated compression units for those with hearing losses a spirometer and a sound level meter Complete series of records movies books and other materials are available Constant revision and addition of materials are accomplished

The center serves as a teaching source for graduate students of the University of Maryland and continuous research is conducted under the supervision of the clinic staff

Table 2 gives the cause and specific speech disabilities suffered by adults and children the staff required to make the diagnosis and treat the patient and his possibility of returning to duty Stuttering may be primary or secondary The former is manifested by easy repetitions and prolongations the latter by

TABLE 2 *Speech disabilities*

Disability	Cause	Staff required	Return to duty
Aphonia dysphonia	Cancer of larynx vocal nodules polyps pleural effusion misplacement of voice incorrect habitual pitch or vocal mechanism difficulties	Otolaryngologist psychologist speech pathologist	Yes
Laryngitis with hoarseness laryngectomy	Carcinoma tuberculosis etc.	Otolaryngologist psychologist speech pathologist	Generally retired from active duty Three returned to duty in 1952
Stuttering primary and secondary	Emotional or physical	Psychiatrist psychologist neurologist social worker speech pathologist	Determined by team
Dysarthria	Injuries of the central nervous system	Neurologist neurosurgeon psychologist social worker speech pathologist	Dependent upon severity of residual accompanying the dysarthria
Articulatory defects slight omissions distortions and substitutions of sounds	Mental deficiency cerebral palsy cleft palate hearing deficiencies emotional factors	Otolaryngologist audiometrician speech reading specialist auditory training therapist speech pathologist psychiatrist psychologist social worker	Yes
Cleft palate	Carcinoma etc.	Pathologist plastic surgeon prosthodontist psychologist speech pathologist	

TABLE 2 Speech disability — C t d

D b l y	Ca	S f f q e d	R u r d y
Alpha	C l i f t c l u d g g h w d b r a l v a u l a u r y m m	N u r l g u r u g p y h l g t c l w k p h p a t h l o g t p n a l h p t d p h y l h p	D p e d n p o n h y f h d b l y F q l y p a f d V A d m t r A p h a C f l l w g d h a g Y
C l i f t p a l t p e h	C l i f t p l s u f f p l o p h a r y g l c l u r	P l s u r g e p h o d t p y h l o g a t p h p h i g d l w k	
C b l p a l y p h	D a m a g f t h n a l y t m	V l g r e d p h y l d o c p a n a l p e l p y h l g l w k d p h g a h o l g	
D l y d p h r u d d d v e l p m f p e h h l d n	M a l d f y b l g e l f t p a l a h g d f e m n a l f a	P y h u r l g l g p d t r a s p h l g t c l w o k u d m e a d p h p a h l g	

fear reactions, forced prolongations, repetitions, facial contortions, avoidance reactions, and substitutions of words

If the patient is considered to have a speech difficulty within the limits outlined in table 2, he is transferred through the Armed Services Medical Regulating Office to the Audiology and Speech Correction Center, Walter Reed Army Medical Center

CONCLUSIONS

The needs of a patient handicapped by a speech defect can best be met at a center where the co-ordinated services of many professional skills can be used. Treatment is facilitated by the presence of specialized, trained personnel and by the use of modern electronic equipment.

Value of the Clinical Conference

The clinical conference in which students, house officers, and faculty participate is probably the best teaching exercise in our medical schools today. We need to make the clinicopathologic conference as Churchill of Boston has so aptly remarked, less of a guessing game and more of a critical review directed at ascertaining whether the therapeutic course prescribed and followed was the best that could have been offered the patient. In other words, how much better if at all was postmortem wisdom than ante-mortem vision?

It must be heartening to undergraduate medical students to see how fallible their professors are. It must be even more reassuring to them to hear their teachers confess their errors, pointing out how at various stages in the illness a more astute and sensitive appraisal of the situation might have had a better and happier ending. Conferences conducted with the greatest candor in which the spirit of the discussion is directed at determination of how the milk was spilled—not who was responsible for spilling it—produce an atmosphere, I believe, in which students are most likely to be imbued with a passion for the pursuit of knowledge.

—OWEN H. WANGENSTEEN, M.D.

in *New England Journal of Medicine* p. 955 June 19, 1952

THE ARMY PHYSICAL MEDICINE SERVICE

CHARLES D SHIELDS L ut t C I I MC USA

PHYSICAL medicine and rehabilitation has developed as a special field of medical practice to meet specific needs of certain patients. The growth of this specialty since World War II has created a demand for trained personnel who are not always available. Physical medicine services are established in comparatively few Army medical installations. It is therefore appropriate to present a concept of the purposes and use of this service.

AR 40 705 states that "Physical Medicine includes the coordinated and integrated employment of physical therapy, occupational therapy, and physical reconditioning in the professional management of the sick and wounded. This does not define our medical efforts but mentions some of the means that are available to the physician in his practice. Physical Medicine may be defined as a special field of medicine concerned with the diagnosis and treatment of neuromuscular diseases and certain musculoskeletal defects. The prime purpose is to restore the individual to maximum physical capacity.

Paragraph 9a, SR 40 705 1 states in part "a. A Physical Medicine Service will be maintained—

- (1) At all hospitals designated as class II installations
- (2) At hospitals at selected class I installations designated by The Surgeon General (hospitals having a medical officer MOS 3180—hereafter designated physiatrist—as signed for duty) and
- (3) Overseas at hospitals designated by the theater commander concerned.

PHYSICAL MEDICINE AND REHABILITATION

In civilian practice the specialty is described as physical medicine and rehabilitation. In the Army we use only the term physical medicine. Practice in the Army should not be greatly different from practice in civilian life, with the possible exception of our reconditioning activities for convalescent soldiers. Army policy

directs that sick and wounded who will not be returned to duty be transferred to the Veterans Administration. This may affect the magnitude of our efforts but it must not affect the availability or the quality of this essential service. It is not always possible to determine immediately that a given patient will not return to duty and certain classes of patients are not eligible for transfer to the Veterans Administration. If physical medicine procedures are necessary, they are indicated when the patient takes to his bed with disease or injury.

Physical medicine is concerned not only with therapy but also with diagnosis. Patients are usually referred to the service because of some generalized or segmental weakness associated with the neuromuscular or musculoskeletal system. Examples of these conditions are chronic neurologic diseases, poliomyelitis, paraplegia, hemiplegia, arthritis, and peripheral nerve injuries. Supplemental therapy is also offered for many other types of medical and surgical patients. When physical rehabilitation becomes the major problem in the management of these neuromuscular diseases the patient should become the responsibility of the physical medicine service. This service, like any other specialized effort, is not complete within itself. Every person who is disabled has some emotional reaction to his disability and may have difficulty with any of his special senses or systems. Physical medicine personnel must recognize the broad social responsibilities that the physician and his associates are asked to assume in modern medical practice. Many of our physically disabled patients need the advantages of education in special schools, with specially trained teachers.

The military services sponsor and conduct a high type of technical training in their school systems. Some of our less severely physically handicapped personnel, who are retained in service, have had and may receive training and retraining in these facilities so that they may continue their military careers. Physical and vocational rehabilitation of the severely handicapped is of necessity a responsibility of other agencies, but our patients must have the best in physical rehabilitation as long as their condition warrants, or until they cease to occupy our beds.

PERSONNEL

Duties of personnel assigned to the physical medicine service

It is the duty of the physiatrist to examine the patient, make a diagnosis, estimate the reversibility of a given condition, prescribe treatment and the goal of treatment, to evaluate progress, and to discharge the patient when maximum benefit has been reached. It is the duty of the therapist to supervise and render the therapy and training as it has been prescribed by the physician.

It is the duty of the technician to assist the physician or the therapist he is never given direct responsibility for the treatment of the patient

Assignments In every human endeavor there seems to be a shortage of trained people Personnel must, therefore be used to the best advantage Patients with neuromuscular diseases and musculoskeletal defects are usually assigned to specialized installations Because physical medicine is concerned chiefly with the treatment and training of the physically disabled adequately staffed and highly specialized services are established where there are large numbers of patients with amputations paraplegias, hemiplegias poliomyelitis peripheral nerve injuries and like conditions It is desirable to assign a physiatrist wherever there are physical and occupational therapists and physical conditioning officers but this is not possible and we must be realistic *The physical therapist and the occupational therapist in smaller hospitals must continue to render treatment to patients with fractures under the supervision of the orthopedist to medical patients (e g arthritis) under the supervision of the internist to surgical patients (e g burns) under the supervision of the surgeon*

It is doubtful that we shall ever have enough physicians trained in physical medicine and rehabilitation to supervise all our therapists Fortunately our system of specialized centers minimizes the need There is however a great need for other physicians who use the services of physical therapy and occupational therapy to have some understanding of the basic fundamentals of physical medicine and rehabilitation

Physical therapy and occupational therapy are most effective when they are part of a complete medical program The therapists are trained in the technics of treatment and the theory necessary for their application They are not trained in diagnosis and indications and are placed in an embarrassing and untenable position when they are asked to assume these obligations

HOSPITAL WARDS

The purpose of physical medicine wards is to treat patients whose major need is physical rehabilitation and training Advantages are (1) patients with similar disabilities are gathered together for better control and service (2) therapy and training are available for longer periods each day (3) convalescence may well be shortened because patients who are approaching maximum benefit from training and therapy serve as an inspiration to those who are newly arrived and (4) the special technics of rehabilitation nursing are made available and all personnel who have duties on these wards can develop in themselves and in their pa-

tients an improved concept of disability and the technics of its management

Controlled wards offer better training opportunities in teaching hospitals for residents, interns, and ancillary medical personnel whose mission is training of the disabled soldier to obtain maximum capacity by full use of his residual abilities

Physical medicine wards must not be confused with custodial care of convalescent patients who are about to return to duty or who are awaiting some other type of disposition. These patients do not need the services of specialized physicians and therapists

OBJECTIVES

The ultimate aim of physical medicine and rehabilitation is to provide the patient with maximum functional capacity for self care and self support

Physical medicine technics are designed to

- 1 Prevent contractures and deformity of paralyzed segments and to protect and support soft tissue weakness. This seldom means total immobilization unless bone damage also exists and the patient is a primary orthopedic responsibility. Functional devices have limited use and can give the patient a false sense of security. They should be easily and frequently removed so that the therapist and the patient may extend their efforts to prevent tightness and contractures. They are only a part of a complete program. They must be removed in whole or in part as soon as function returns to an adequate level. When loss of function is permanent functional devices may be used to adapt a segment to function.

- 2 Establish and improve function of innervated segments

- 3 Improve muscle power and strength, joint range of motion, and functional capacity in individual segments or on a general basis

- 4 Provide a means of physical rehabilitation within the physical capacities of the patient. In most clinics this includes a minimum of pre-vocational testing and little or no vocational training. Care of the patient must include some assistance toward proper motivation, recognition, and acceptance of the disability and a reasonable concept of self-care and responsibility.

DISCUSSION

An adequate, efficient physical medicine service can be established only by trained personnel with proper space and equipment. High standards of training for physicians, therapists, and technicians must be established and maintained.

Improved standards of medical care have resulted in a great increase in the number of individuals who are not physicians but who render services to our patients. It is most essential that the medical profession determine what services these ancillary personnel should render to the patient and how much training they need to do their job well. It is also essential that they be continuously under medical supervision so that they do not develop forms of independent practice that permit them the privileges of the physician without his responsibilities. This does not mean that training of therapists and others should be decreased or altered for it is only with high standards of training that the physician can effectively and dependably use their services.

Many of the techniques of physical medicine and rehabilitation seem simple in themselves but they are numerous and only skilled personnel can use them effectively. We sometimes hear that "Anyone can do those things for patients." This concept has retarded total rehabilitation and its value to the patient and to the Nation for many years. Anyone can hand a patient crutches but some skill training and experience is necessary to teach him to use the crutches. Too many patients have been taught to wear a prosthesis without being taught to use one to best advantage. The ultimate efficient value of physical medicine and rehabilitation is determined by its benefit to the patient.

Until recent years training for physicians in physical medicine and rehabilitation was far from adequate. It is still not perfect but residency training is better organized and prepares physicians much better to understand their mission and to assume responsible positions. The intrinsic value of this special field is evidenced by its rapid growth and the demand for well trained personnel to meet existing needs. Sound growth and a continuous supply of physicians and therapists seeking training can be assured only by the establishment of adequate services operated by thoroughly trained personnel where a real need exists.

SUMMARY AND CONCLUSIONS

Physical medicine is a special field of medical practice concerned with the diagnosis and treatment of neuromuscular diseases and certain musculoskeletal defects. Physicians, therapists and technicians work as a team and each has his own duties and responsibilities. Patients who merit these services should receive the best available treatment and training while they remain in the hospitals.

Complete physical medicine services must be established in specialized centers where the need is greatest. A shortage of physicians trained in the specialty necessitates that therapists and technicians be assigned to certain installations to treat patients under the supervision of physicians who are not specialists in physical medicine.

A physical medicine ward has its advantages in treating patients whose major need is physical rehabilitation and training, and it offers training opportunities for residents, interns, and ancillary medical personnel. The ultimate aim of physical medicine and rehabilitation is to provide the patient with maximum functional capacity for self care and self support.

U S Army Hospitals Opened to ROK Patients at Taegu and Pusan



On 2 November 1953 the first ROK Army patients were transferred to the 25th U S Army Hospital at Taegu and to the 21st Station Hospital at Pusan as part of a widespread program to relieve congestion in Korean hospitals and broaden the medical assistance given our allies. Shown above from left to right at the 1st ROK Army Hospital are the senior medical officers who directed the initial movement of patients. Colonel Raymond E. Duke, MC, USA, Chief of Operations, Office of the Surgeon, U S Army Forces, Far East; Colonel Rollin L. Bauchspies, MC, USA, Surgeon, Korean Communications Zone Brigade; General Shin Hak Shin, Surgeon General, Korean Army; and Colonel Frank O. Alexander, MC, USA, Surgeon, U S Military Advisory Group to the Republic of Korea.

AN EVALUATION OF EFOCAINE IN RECTAL SURGERY

MELVIN B SULLIVAN *Lt a i MC USN*

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VARIOUS methods for the alleviation of postoperative pain following rectal surgery have been described. The importance of the problem is manifest by the reluctance of many patients with rectal symptoms to consult a surgeon or by refusal to undergo rectal surgery. Attempts to solve this problem have taken various forms. Several different techniques of hemorrhoidectomy have been advocated, often with the claim that a particular method results in less postoperative pain. Likewise, many surgeons have tried to minimize pain with elaborate and expensive programs of postoperative care.

It has long been obvious that a local anesthetic with a prolonged effect would have an ideal application in the prevention of pain following hemorrhoidectomy, provided that it fulfilled certain criteria: (1) the agent should actually prevent pain in the majority of the cases in which it is used; (2) its use should not result in complications such as delayed wound healing, sloughing, or abscess formation; (3) relief of pain should not be accompanied by incontinence; and (4) the agent should be systemically non-toxic in therapeutic dosage.

In 1928 Yeomans and his associates introduced a method for producing long acting local anesthesia. They found that by dissolving the anesthetic agent in oil, effective relief of pain was obtained for several days. Various mixtures of anesthetic agents in oil were subsequently developed and gained wide popularity. However, in 1943 Smith reported that 6 percent of his rectal surgery patients developed postinjection abscesses. Other authors had reported a similar incidence of complications. Finally, Duncan and Jarvis demonstrated that the prolongation of anesthesia was due to the neurotoxic action of the common preservative benzyl alcohol and was not due to the slow absorption of the anesthetic agent from its oil base as had been previously thought. Following these reports, anesthetics in oil fell into disrepute.

and not until efocaine was introduced in 1952 was a promising long acting local anesthetic available

Efocaine is described as a nonoily, aqueous miscible, saturated solution of procaine, procaine hydrochloride, and butyl p amino benzoate in a nontoxic, aqueous solvent. Its property of long action is due to precipitation on dilution with minute amounts of tissue fluid, and the subsequent slow absorption of the crystal line procaine base, with minimal toxicity and tissue damage. These claims for efocaine are supported by a number of authors² who found that effective local anesthesia was produced for from 6 to 14 days, that the agent materially decreased postoperative narcotic requirements, and that its use was not attended by complications.

In order to evaluate its effectiveness and safety, a record of the narcotic requirements and ensuing complications was maintained for 100 consecutive patients undergoing hemorrhoidectomy, 51 of whom received the drug. The decision to use efocaine was that of the operating surgeon, but no selection of patients was exercised. The technic of injecting it as described in previous articles and in the descriptive commercial brochure was carefully observed in all cases. From six to 10 cc of efocaine were injected preoperatively through the prepared perianal skin, care being taken to avoid penetration of the rectal wall and pooling of the agent. All patients had caudal block anesthesia and the surgical technic and postoperative care were similar.

TABLE I Requirement for narcotics with and without efocaine

	Received efocaine	Did not receive efocaine
Total number of patients in each group	51	49
Average number of doses of narcotics required	3.7	3.2
Morphine or meperidine hydrochloride	(2.0)	(2.5)
Codeine	(1.7)	(0.7)
Average number of days narcotics were required	3.1	2.1
Number of patients not requiring any narcotics	7	5

The patients who received the drug required an average of 3.7 doses of a narcotic over a period of 3.1 days (table I). It should be pointed out that only 2 doses of morphine or meperidine hydrochloride (demerol) were required and the remaining 1.7 doses were

codeine The patients who were not given efocaine required an average of 3.2 doses of a narcotic over a period of 2.1 days, but 2.5 doses were morphine or meperidine hydrochloride, and 0.7 doses were codeine Seven of the patients who received efocaine did not require any postoperative narcotic as compared with five of the patients who did not receive efocaine Six postoperative perianal abscesses developed in the series all of them in patients who had received the anesthetic agent In one of these patients the skin margins had been sutured inadvisedly and this may have contributed to the abscess formation If this case is excluded the incidence of complications is 9.8 percent for the patients who were given efocaine and 0 percent for those patients who did not receive it None of the patients in either group developed incontinence postoperatively and no evidence of systemic toxicity was noted in patients receiving efocaine

SUMMARY

A record of the narcotic requirements and ensuing complications was kept on 100 consecutive patients undergoing hemorrhoidectomy 51 of whom were given efocaine There was little if any demonstrable relief of posthemorrhoidectomy pain in the efocaine group as compared with the controls The incidence of perianal abscess was approximately 10 percent in the efocaine group whereas this complication was absent in the control group

It is recognized that our experience with the anesthetic agent is at variance with the experience of the majority of those who have reported on its use No explanation for this is apparent

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SIMPLIFIED AND EFFECTIVE METHODS FOR FILLING ROOT CANALS

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AS a result of recent developments in pharmacologic remedies used as adjuncts to the mechanical cleansing of septic root canals including the intracanal antibiotic therapy advocated originally by Grossman,¹ the problem of obtaining a sterile canal through endodontic treatment has been reduced to a minimum. Verification of such a sterile condition is facilitated by the use of routine bacteriologic smear and culture tests. Negative tests together with the favorable clinical signs of no tenderness in the tooth, no foul odor in the canal, and no excessive exudate in the canal provide an accurate basis for the determination of the readiness of the root canal for filling.

The obtaining of a sterile condition in the root canal however is only a part of the procedure required to maintain the tooth in a state of health. It is necessary to obliterate the canal space completely with a nonirritating and hermetic sealing agent. Failure to do so will result in the accumulation and stagnation of tissue fluids in the unfilled canal or any unfilled portion thereof. These stagnated fluids provide an excellent nidus for bacterial growth with inevitable acute or chronic apical periodontal involvement. Adequate attention, therefore, should be given to the canal filling portion of endodontic therapy.

GUTTA PERCHA TECHNIC

Although other materials have been advocated for the filling of the treated canal the use of gutta percha together with an antiseptic cementing substance enjoys the most popularity because of the ease of manipulation of those materials and the excellent results achieved. Several methods may be followed in filling the canal, the one of choice being determined by the size, shape, and general anatomy of the canal.

The single cone method is used to advantage in those canals which because of their small size, can be almost completely

obliterated by the use of one gutta percha cone. The sealing of a properly fitted cone into the canal with the antiseptic cementing substance results in the obliteration of the entire canal space.

The lateral condensation method is effective in the larger canals where a single or master gutta percha cone falls decidedly short of filling the canal in the areas lateral to the master cone. The procedure consists of carrying a previously fitted master cone to its correct location in the canal the walls of which have been coated with the antiseptic cementing substance. The master cone is condensed laterally against a wall of the canal thus eliminating the space on that side of the cone and increasing the space on the other sides. The increased space is then filled in with a series of previously prepared smaller auxiliary gutta percha cones until it is entirely obliterated.

The sectional method also is used in larger canals as well as in the smaller ones. It is particularly indicated for treating a tooth which because of extensive loss of coronal substance will require a metallic post in the root canal as retention for the restoration of the crown subsequent to endodontic therapy. In this method the apical 3 to 4 mm. section of a previously fitted master gutta percha cone is cemented into its correct apical location in the canal using the antiseptic cementing substance. The remainder of the canal space is then obliterated by condensing into it a series of sections of gutta percha which have been softened by being warmed slightly. The resulting secureness of the important apical portion of the canal filling guards against its dislodgment when enough of the filling is removed for the accommodation of the retentive post.

The sectional method also is effective in the filling of the canals of teeth wherein the apexes of the roots are not completely formed and the canals are extremely wide. In such a case a large master gutta percha cone inserted butt end first into the canal is properly adjusted and fitted. The apical segment is sealed in its correct position and the remainder of the canal is left unfilled until the return of the patient for the next appointment. At that time the efficacy of the sealing of the apical foramen by the previously placed gutta percha segment is determined by the lack of intracanal periapical fluid seepage. If conditions are favorable the remainder of the canal is then filled by completion of the sectional method procedures.

The proper fitting of the master gutta percha cone is essential to all of the foregoing methods. It should be as large as will pass completely to the apical end and its adjusted apical cross section should fit the apical foramen snugly. This will prevent protrusion of the master cone into the periapical space as a result of condensation procedures incident to the filling of the canal.

The following antiseptic, nonirritating, and radiopaque root canal cement advocated by Rickert² is characterized by ease of manipulation, adequate working time, and permanence of dimensional form

Powder	Percent
Zinc oxide, C P	41 2
Precipitated silver, C P	30 0
White rosin	16 0
Thymol iodide, N F	12 8
Liquid	
Clove oil, U S P	78 0
Canada balsam	22 0

SILVER CONE TECHNIC

The use of metallic master cones in the filling of root canals is not entirely new, but Jasper³ developed and refined the use of silver cones in filling certain canals having special anatomic characteristics. The curved, narrow, or tortuous canals often occurring in the lower anterior teeth and the upper bicuspsids, the buccal canals of upper molars, and the mesial canals of lower molars are more amenable to the fitting of the stiffer silver cone than of the softer gutta percha cone. In many other cases where the single cone or lateral condensation method is to be employed a master cone of either silver or gutta percha can be used optionally with equally effective results. The use of silver cones, however, is contraindicated in the canals of teeth that have such extensive loss of coronal tooth substance as to necessitate the use of a metallic post in the root canal as retention for the ultimate restoration of the crown of the tooth. This is because of the difficulty or even impossibility of removing a portion of the canal filling for the accommodation of the retentive post without dislodging the important apical portion of the filling.

Figure 1 is a radiograph of a lower cuspid having a necrotic pulp with apical periodontal involvement, resulting from lack of earlier treatment. Figure 2 represents the fitting of a master silver cone into an enlarged canal. The cone blocks the apical foramen and snugly fits the canal in its apical one half. Additional space in the crown portion of the canal can be seen. In order to provide a guide as to the correct location of the cone when it is reintroduced, the incisal excess of the cone has been bent over the incisal edge of the tooth. Figure 3 shows the canal filled by the lateral condensation method, using a master silver cone. The additional space in the crown portion of the canal seen in figure 2 has been completely obliterated through the use of smaller auxiliary gutta percha cones. Figure 4 illustrates apical periodontal

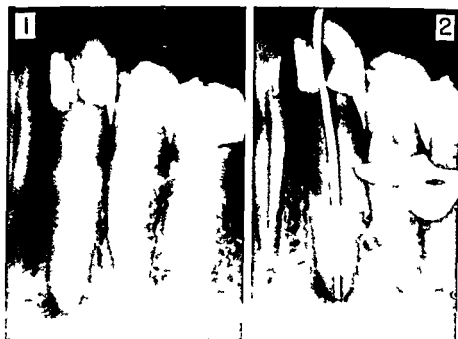


Fig 1 D a g t a d g p h Fig 2 M t l o f t t d

healing 10 months after the canal was filled with no resort to surgical intervention. Healing occurred due to (1) the effective

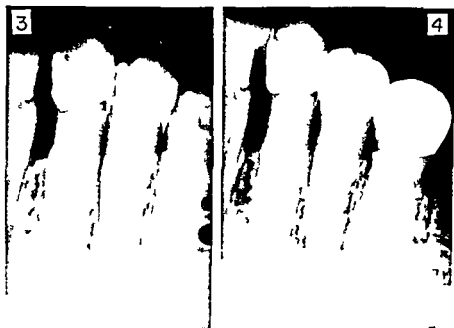


Fig 3 Root ca l l l d Fig 4 A p l p e o d o t l b e l g 10 m t h s l a t

ness of the endodontic therapy in eliminating the septic condition of the root canal which was the cause of the apical periodontal involvement, (2) the complete obliteration of the root canal space, and (3) the tissue healing ability of the patient

SUMMARY

Present day endodontic therapy is effective in obtaining a sterile condition in a root canal that, previous to treatment, was septic. It is necessary, however, to obliterate completely the canal space after its sterile condition has been verified by bacteriologic smear and culture tests and by favorable clinical signs. Simplified and effective procedures for filling root canals have been presented.

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Construction of Dentures

If the dentist is to feel lasting satisfaction with the immediate dentures which he makes their construction must be planned to give the patient long range service. At present too many immediate dentures are planned for temporary service only. In many cases therefore the dentures give temporary rather than permanent service. The patient's apparently quick facility in using the immediate dentures especially an upper denture deceives many patients and dentists. Trouble manifests itself slowly with a hypertrophied anterior ridge soreness and a loss in the stability of the dentures. Too often the dentist is confused about his final obligation to the patient. He seems to like the first phase of the work and to dislike the follow up reconstruction. Consequently the construction of many immediate dentures reaches only the insertion stage and the dentures are never fully completed.

—MERRILL G SWENSON D D S

Journal of the American Dental Association, p 550 Nov 1953

CAREER PLANNING FOR THE ARMY NURSE

HARRIETH WERLEY M J , ANC USA

SINCE 25 June 1962 the same principles and procedures of career management have been applied to the Army Nurse Corps as are found in effective operation for the other corps of the medical service

Career planning implies guidance in the movement of an officer from positions of least responsibility to those of greatest responsibility and early proper classification of personnel is necessary. Many Army nurses carried a Military Occupational Specialty (MOS) code which had been awarded locally during the war years and for which they were not qualified especially in the supervisory and administrative groups. To correct this MOS awards are now more restrictive and are based on the educational and experience background and the ability to perform as evidenced by efficiency reports.

Close liaison between the personnel officer and the chief nurse is most essential to properly record the duty performed by a nurse. That section of the Officer's Qualification Record card which calls for an indication of the duty MOS too frequently carries a broad MOS title. This often gives no indication of the clinical area in which the nurse is performing nor of the level of her responsibility which may range from general duty nurse to head nurse or supervisor. Later in the officer's career this may be of prime importance to change her classification based on her experience. The record is much more meaningful if it reflects her duty as MOS 3449 nurse general duty orthopedic ward or MOS 3449 head nurse cardiology ward or MOS J3449 supervisor medical service and so on.

The matter of properly crediting the officer with duty performed is equally important when rendering efficiency reports and entries on the officer's WD AGO Form 86 and Item 10 of DA AGO Form 67-3 should correspond.

A career guidance card specifically adapted to nursing has been designed and when completed will present valuable information.

From Office of The Surge General Department of the Army Washington D.C.

ration on each Regular Army nurse. This card will be particularly useful regarding advanced training and will reflect preferences, present assignment, and a future assignment which is planned in terms of experience indicated necessary to round out a career.

Career patterns have been drafted. Comments, suggestions, and constructive criticism are solicited from nurses and some of their ideas may be incorporated in the final drafting of career progression patterns.

Policies and procedures pertinent to the army school system are put into effect by the career guidance section. For career courses, selections are made from established eligibility lists. The Nursing Administration Course of the Medical Field Service School is a career course and nurses do not need to apply to attend it. The officer's preference card, submitted in the fall of one year should reflect the educational preferences of each nurse for the next year's activities because the preference cards are used for this purpose.

In August 1953 an intermediary course was started to properly prepare the Regular Army company grade officers to assume head nurse-supervisory responsibilities.

For the first time, a block of field work, under the joint supervision and direction of the nursing instructor staff at the Medical Field Service School and the supervisory staff of Brooke Army Hospital, will be given annually to selected nurses to prepare them for duties of a head nurse and supervisor. This type of learning experience will compare favorably with courses given in a university in which field work is accorded students as part of the degree program requirements.

The professional nursing specialty courses, such as neuropsychiatric nursing, anesthesiology, and operating room technique and management, are open to qualified applicants. The same is true of courses at civilian institutions. Nurses attending civilian institutions will be predominately those who will major in nursing education and trained for teaching assignments in the service schools. A few may be assigned in the areas of nursing research and personnel administration.

Surveys and studies have been made analyzing the Army Nurse Corps membership in terms of age groups and educational level, both military and civilian. From these, our training needs will be determined and a sound plan will be made for the orderly progression of officers through service schools and civilian educational institutions aiming to equitably allocate these privileges.

A study in the fall of 1952 revealed that 350 (23 percent) of all Regular Army nurses in the 35 to 39 year age group had never

attended a service school as opposed to 329 (7.9 percent) of all Reserve nurses in the same age group

Eligibility lists for service career courses are being established and because career guidance connotes looking to the future emphasis will be placed on developing the 30- to 39 year age group. This is sound for several reasons: (1) it is in keeping with the Army philosophy of expeditiously educating the young outstanding officers; (2) it means preparing officers for a position prior to being thrust into it; (3) it is presumed job satisfaction will be increased; (4) it will prevent that group reaching the maximum age without the benefit of proper career training; (5) the service will get the individual's greatest contributions earlier in her career and for a longer time; and (6) youth will know it is recognized in the Army Nurse Corps and seeing challenging positions within future reach will continue to render competent performance and grow in stature.

Giving youth an opportunity in the Army Nurse Corps may help the procurement of young nurses for the Regular Army. The survey quoted above also revealed that there were 48 nurses (3.2 percent) in the Regular Army below the age of 30 while there were 1,116 (28.2 percent) in the Reserve Corps on active duty below the same age.

At this point it is impossible to go back and give those in the 40- to 50-year age group school opportunities which rightfully might have been theirs a number of years ago had a career planning program then been in effect. This group must be most generous in their understanding of the situation at hand and in their support of the necessary step to prepare tomorrow's leaders. Training opportunities will also be available to the older group in the form of an occasional short course, workshop, or institute but mainly through developmental assignments and individual initiative. Many of these now hold the grade and position of leadership and have the ability and will to keep abreast of developments.

Appropriate preparation of members of the Army Nurse Corps is essential if they are to assume the proper responsibilities in administering excellent nursing care to patients. Those occupying key positions must be prepared to make contributions to improved patient care and staff development. In an agency whose mission is service career development consists essentially of in-service education and on-the-job practical training. This demands good leadership at all installations. As the nursing profession is growing in professional stature it becomes increasingly essential that Army Nurse Corps officers compare favorably with their civilian counterparts. Critical shortage of personnel and emphasized economy unfortunately preclude giving all the necessary

training on a full duty status. Every effort must be made to capitalize on off duty study opportunities.

Every assistance and guidance will be given the nurse in her choice of accredited schools from which she may take suitable courses, so that her accomplishment, such as her attainment of the two-year level, the baccalaureate level, and the master's level or beyond, may be recorded officially on the WD AGO Form 66. Reserve officers too, are interested in having their level of accomplishment recorded.

All nurses are eligible to take the Graduate Nurse Qualifying Examination, and universities with departments or schools of nursing allow varying amounts of college credits for successfully passing these examinations. Frequently, the number of semester hours earned in this way generously exceeds the 30 credits which Army regulations prescribe as the equivalent for the three year hospital school of nursing program. Those officers who have not yet attained the two-year college educational level should take this examination under the direction of a nearby college and have the results evaluated. They may then qualify for the two-year college level education by part-time study. Once the nurse gains this primary educational objective, she may find her studies so stimulating and helpful that she will then strive for a bachelor's degree.

Arrangements for obtaining these tests may be made through the Department or School of Nursing of the college or university which will be designated to receive the results for evaluation. In some cases arrangements may also be made directly with the National League for Nursing, 2 Park Avenue, New York, N. Y., to have the tests given to a group under the guidance of a qualified psychology staff.

Type of assignment rather than specific assignment is recommended by the career guidance section. A nurse's total career record is reviewed and recommendations are made in accordance with experience gaps identified or her qualifications for certain positions. The assignment section then tries to reconcile operational requirements, the personal desires and preferences and the recommendations, or the long range goal of development of the person.

Career planning for the Army Nurse Corps should be of great interest to all, and especially to the younger nurse. The recent graduate will find military nursing stimulating and attractive.

The Returned Prisoner of War

The family doctor consulted by a repatriated prisoner of war may find that experiences during internment have had deep psychologic as well as physical effects and that the former are likely to be of special importance during the period of resettlement. The serviceman never expects capture and the violent change affecting every detail of his life strains all his bodily and mental resources. He is extremely depressed on capture. Weary, hungry and longing for rest and security, he may be treated harshly and cruelly. The daily routine in which he had an established status has vanished. The customary habits are interrupted and his individuality is lost. He is just one more prisoner and his survival is of no interest to his captors. But this stage soon passes. He acquires new habits of life, accepts the grim situation, hopeful that somehow he will find means of escape. The group life of the camp, the irritations, the short tempers, the hard conditions, the monotonous and often insufficient food, the indefinite nature of his internment are offset by efforts to score off his captors, to outwit them, and by a growing comradeship. The circumstances of his past life become idealized and he pictures the future in rosy colors. Captivity anyhow will not last forever; when he gets home he will live as he has never lived before. These dreams of the future are a necessary and valuable compensation.

Many soldiers, particularly professionals, experience a sense of guilt on capture. The notion that he may be regarded as an unheroic figure because he is no longer fighting can lead the prisoner to expect a loss of caste in the eyes of those at home. Men captured after a tough fight and when every round of ammunition has been fired are free of this thought. The feeling of guilt is always intensified by thoughtless letters from home criticizing the prisoner for his capture and mentioning his newly found safety.

Some of these returned prisoners at the difficult period of repatriation are now seeking their doctors' help. In the excitement of returning to his family and with the prospect of realizing his dreams, the repatriated man has probably forgotten the inevitable changes that time has worked in his home and his friends. His family have been forced to deal successfully with life without him. His children or his brothers and sisters have developed new

interests. Should his wife have left him, he faces a catastrophic situation. The gulf between fantasy and fact is often extremely painful. The limited imagination of his family fails to picture the utterly different life he has led and is unequal to the strain of surrounding the returning soldier with sufficient sympathy. When the early days of home-coming have passed, the serviceman may get the impression that in some way he has failed. The thought of personal guilt is repressed, becomes unconscious, and is projected. Then there come scathing remarks about politicians, employers, and those who in the security of home have become prosperous. The returned prisoner often has difficulty in resuming the daily financial responsibilities from which he was for a time free. In addition, his working skills may be impaired. In this atmosphere he may become aggressive, apathetic, or depressed, and perhaps alcoholic. Some even drift into crime as offering more excitement and a short cut to affluence. The problem of housing often intensifies the depression and resentment. Psychoneurotic symptoms—a fear of confined spaces, of crowds, of social occasions—may appear, and a tendency to exaggerate physical symptoms.

The doctor does not see those who grapple successfully with their difficulties. But the wise course with the man who consults him is to attend to his physical ailments and assure him at the same time that he is a normal person whose difficulties are in large measure due to the problem of resettlement. If the patient is unresponsive to simple measures, if he remains tense and maladjusted and suffers from insomnia, it is wise to call in a psychiatrist. Every man who has been a prisoner, even for six months, will be affected by it to some degree, and those who have been interned for two years or more will suffer more severely and their resettlement will be correspondingly difficult. Prisoners in Japanese camps during the second world war, and some in Korea, were always hungry. Food became the chief topic of conversation in prison camps and prison hospitals. Hunger overshadowed other instinctive tendencies and sexual thought and activities faded. Abdominal symptoms are often mentioned by such prisoners on repatriation; they are concerned about bowel movements and complain of vague abdominal pains. Digestive troubles are to be expected with the change of diet—for example, from rice to service rations. Extreme cold was common in Korea, but usually the staple diet of Indian corn, although lacking in variety, was adequate. Considerations of this kind should be taken into account and a straightforward explanation of the symptoms given with firm reassurance that with treatment the trouble will quickly settle down. A quite unnecessary dread of impotence often follows the diminution of sexual interest. Again and again repatriated prisoners assert that they have suffered physically

harm and that they will never be the same men again. This fear of impotence often leads to sexual incompetence on repatriation. The origin of the fear and the fact that it is common should be explained and the assurance that it is groundless should be given and can be given with confidence. Neurosis is rare among returned prisoners of war and was almost unknown in the survivors of Japanese prisoner of war camps. Most of those released from Japanese internment were in sound physical and mental health for the weaker had not survived. Even so many were anxious about their health.

The difficulties of resettlement rather than the hardships of internment are likely to be the precipitating factor in neurosis. The physical complaints of young repatriated men can usually be treated on familiar medical lines but psychologic symptoms may be persistent. The doctor should avoid comments on imaginary illness and avoid also the words prisoner of war or prisoner for they are unpopular with ex-prisoners. No reference should be made to the circumstances of capture and even when the patient mentions the subject discussion should be brief. The doctor asked to support a claim for a disability pension should be sympathetic but cautious. A pension has inevitable charms but its effect on character may be detrimental. The patient must be encouraged to take up his civil life without delay. At every employment exchange there is an official whose special task is to advise on any employment problem and to give information on the training schemes available for men who want to learn a trade or to enter a profession. The period of resettlement need not be unduly difficult. It is a transitional period when timely advice and informed common sense can modify unprofitable attitudes of mind towards illness and towards society.

Use of Cortisone in Addison's Disease

Although Addison's disease is relatively rare and new cases uncommon there are opportunities for making systematic investigations correlating biochemical and psychologic changes with therapy. Few workers have had much chance to observe the effect of cortisone in this condition. Rewarding results might reasonably be expected if clinical investigations are carefully carried out by endocrinologic and psychiatric techniques prior to and following treatment with cortisone of allied compounds.

—ROBERT A. CLIFGHORN, M.D.

Jou. of Clin. Endoc. & Metab. 12:93 Oct. 1953

MULTIPLE SCLEROSIS WITH ACUTE ONSET

Report of a Case

MYRON KASS *Lieutenant MC USNR*

THE presenting symptom of acute multiple sclerosis in a 17 year old man was a seizure of grand mal epilepsy. An acute onset of multiple sclerosis is more uncommon than a chronic, insidious onset, but an acute onset with the presenting symptom of an epileptic attack is even more unusual.¹⁻³ The literature reports an incidence of eight to 13 percent of cases of multiple sclerosis with one presenting symptom being epilepsy. The triad of hysteria, diplopia, and varied neurologic signs is the commonest presenting picture encountered. The differential diagnosis between hysteria and multiple sclerosis always necessitates careful consideration.

CASE REPORT

A 17 year old man was admitted to the hospital via ambulance on 17 December 1952 from aboard ship. He had previously been hospitalized from 1 until 10 December 1952 for osteochondrosis of the tuberosity of the left tibia.

The hospital corpsman accompanying the patient stated that he had fallen off his bunk while playing cards and was found lying unconscious on the floor. When first seen by the corpsman, the patient was on the floor and seemed to be choking on his tongue. The corpsman stated that the patient made an occasional convulsive like movement of his arms, his pupils were alternately dilating and contracting, he was breathing heavily and he had urinated during the attack. The patient responded to inhalation of spirits of ammonia but was disoriented for recent events. On admission he was conscious but appeared bewildered and gave vague answers to questions. He denied his recent hospitalization.

Physical examination revealed a well developed, well nourished young man in no acute distress. He appeared slightly disoriented. There were superficial lacerations on the under surface of the

om U. S. Na l H pital Br m r t n W h.

chin a small laceration was on the right side of the tongue and a slight swelling of the left knee with subjective tenderness to palpation over the left tibial tubercle

The neurologic examination revealed all the cranial nerves to be intact. The tendon reflexes were present and active bilaterally and the Romberg and Babinski tests were negative. The pupils were round equal and reacted physiologically to light and accommodation.

A grand mal seizure was observed on the ward on 17 December 1952 within 48 hours of admission. This was observed and re-

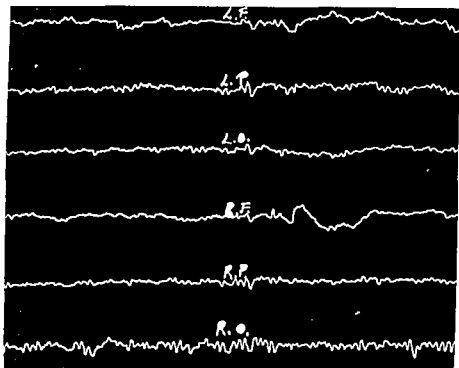


Fig 1 Electroencephalogram taken 22 December 1952 showing a fairly normal baseline of basic 9/sec activity

corded by the medical officer of the day as a typical generalized grand mal convulsive seizure. No new physical or neurologic signs or symptoms were observed.

Routine laboratory examinations on 19 December 1952 and roentgenograms of chest and skull were normal. An electroencephalogram on 22 December 1952 (figs 1 and 2) revealed a grossly dysrhythmic record with consistent bursts of high voltage and rapid β wave activity with marked spiking which is typical of interseizure grand mal activity (fig 2). Abnormal slow waves were also present but there was no indication of petit mal activity.

ity The electroencephalogram was interpreted as an abnormal, markedly dysrhythmic record compatible with grand mal epilepsy

On 23 December 1952 the spinal fluid was under normal pressure and was clear, colorless, and with a cell count of 10, all lymphocytes, glucose was 75 mg per 100 cc, chlorides were 139 mEq per liter, the globulin was negative the total proteins were 32 mg per 100 cc, and the colloidal gold was 0001000000

The neurologic examination on 8 January 1953 revealed a staggering gait, dysphasia, and subjective diplopia The patient complained of numbness of the right face and right arm,

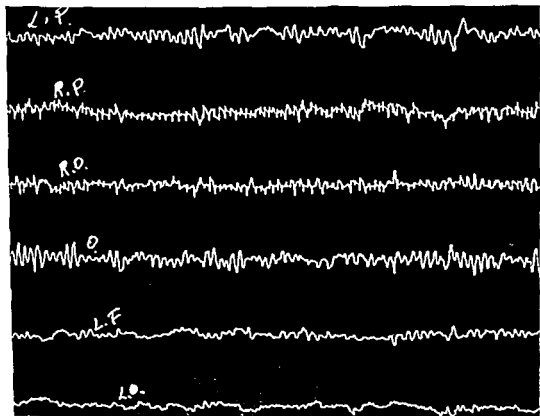


Figure 2 Electroencephalogram taken 22 December 1952 shows rapid inter-seizure grand mal activity with typical spiking

which he stated had been present for the past 12 days Marked histrionic behavior was also noted There was a dissociation of the extra ocular movements of the left eye in which the left pupil lagged in all movements A subjective hypoesthesia of the right face right arm, and hand was present All tendon reflexes were hyperactive but equal The Babinski and other pathologic reflexes were not present On re-examination on the following day the findings were unchanged

The patient's parents were divorced when he was 1 year old He lived with his mother until he was 12 and after that with his

father. He stated that he knew masturbation was the cause of his spells and that they would not recur as he would never practice masturbation again.

On re examination on 16 January 1953 the pupils were pin point but reacted slightly to light and accommodation. A marked lid lag was now present on the left. Hypoesthesia of the right face right arm forearm and hand were again noted. The hyper reflexia was increased particularly in the lower extremities. A right positive Babinski and a questionable left positive Babinski were elicited. Bilateral ankle clonus was present being sustained on the right. His speech was markedly slurred and

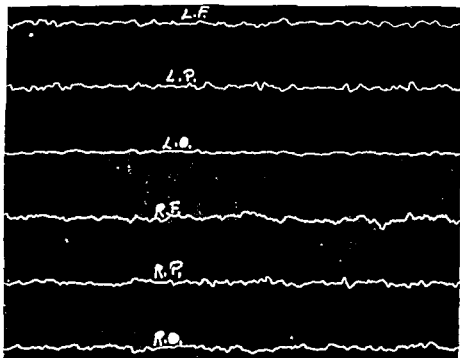


Figure 3 Electroencephalogram taken 19 January 1953 showing marked slowing of all waves.

dysphagia was present. The gait was grossly ataxic and broad based. Because of these conclusive findings the diagnosis was changed to multiple sclerosis acute on 20 January 1953.

Between 16 and 20 January 1953 the patient became weaker, more ataxic and incoordinated and required bed care, feeding and continual nursing care. An electroencephalogram on 19 January 1953 was not readable due to his inability to co-operate. In the first few tracings a marked slowing of all waves was noted (fig. 3). On 20 January 1953 the spinal fluid was clear and colorless with a cell count of zero, the initial pressure was 190 mm of water, the dynamics were free and the closing pressure

was 120 mm of water. Glucose determination was 74 mg per 100 cc and the chlorides were 133 mEq per liter, total protein was 32 mg per 100 cc, globulin was negative and the colloidal gold was read as 11111100000. On 10 February 1953 the patient was transferred to the U S Naval Hospital, Oakland Calif for further treatment and disposition. There he displayed weakness of all extremities with athetoid movements of the right arm and hand, lateral slow nystagmus, no movement of either eye nasally beyond the midline, and diminished sensation in the right face, arm, and leg. The spinal fluid contained 83 mg per 100 cc of protein but was otherwise not remarkable. Roentgenograms of the chest and skull and an electroencephalogram were all normal. On 25 March 1953 a blood sample for virus studies was reported negative for all encephalitides including western equine, St Louis, mumps, and Japanese varieties. The patient's subsequent hospital course was afebrile and characterized by gradual improvement. Although grossly ataxic he was able to walk without assistance. The diplopia improved but was marled. On 17 February 1953 the patient was examined by a consultant neurologist, who noted bilateral third cranial nerve paresis, pyramidal tract and cerebellar signs, and scanning speech. He expressed the opinion that although seizures in multiple sclerosis are exceedingly rare this is the most likely diagnosis.

SUMMARY AND CONCLUSIONS

In a patient with acute multiple sclerosis, with grand mal seizures as the initial symptom there was a lack of significant spinal fluid findings. Fifty percent of patients with multiple sclerosis have an abnormality of the spinal fluid, and 25 percent show a first-zone elevation of the colloidal gold curve (paretic type curve).⁷⁻⁸ In the electroencephalogram presented only a grand mal interseizure record is evident. No discernible pattern of activity has yet been established for multiple sclerosis.⁷⁻⁸

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PERFORATION OF THE ILEUM BY A CHICKEN BONE

Report of a Case

GEORGE B MARKLE *C pta MC USA*

ALTHOUGH most swallowed foreign bodies pass through the gastrointestinal tract unrecognized occasionally one will impact and perforate producing an acute surgical condition. The rarity of this accident explains why it is frequently not diagnosed prior to laparotomy. The case here presented demonstrates some of the problems confronting the diagnostician in such circumstances.

CASE REPORT

A 72 year old woman with known arteriosclerotic heart disease and a history of one coronary occlusion in 1950 was admitted to this hospital at 2300 hours on 24 February 1953 in severe distress. Nausea and cramping epigastric pains had begun that morning later becoming constant diffuse and more severe. Her bowel movements had been regular but the night before she had taken milk of magnesia producing a normal stool that morning. She had vomited food once during the day and again on admission.

An appendectomy and left oophorectomy had been performed in 1914 and either a cholecystostomy or cholecystectomy for gall stones in 1938. She had had osteoarthritis in recent years.

The patient was obese was unable to sit or bend forward comfortably and had severe abdominal pain on moving her body. Her temperature was 98.4 F pulse 76 and respirations 18. The thyroid gland was enlarged bilaterally and had a nodule at the isthmus. Generalized abdominal tenderness more marked in the right upper quadrant was present. There was no rigidity distention tympany or increased peristalsis. Rectal and pelvic examination findings were normal.

The white blood cell count was 29,000 with 85 percent neutrophils. The urine was normal except for a trace of albumin. Icteric index was 9 units and cephalin cholesterol flocculation test and the serologic test for syphilis were negative. An electrocardio-

gram revealed no change from a recent previous one. Roentgenograms of the abdomen showed no abnormalities.

During the next 24 hours the temperature spiked to 101° and 102° F, the pain and tenderness began to localize in the right lower abdominal quadrant, and was accompanied by rebound tenderness and contralateral rebound phenomenon. The decision to operate was made in spite of the known risk based on a diagnosis of ruptured viscus.

A perforation of the ileum due to the sharp end of a chicken bone (fig 1) was found at operation. There was local peritonitis and apparently little tissue reaction to wall off the infected site. The bone, 4.7 cm long, was easily removed and the perforation and abdomen were closed without drainage.

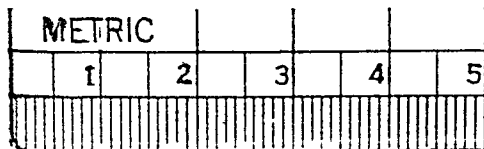


Figure 1 Chicken bone found perforating the ileum

Re examination of the roentgenograms showed a faint shadow of the bone missed on previous examination. When questioned, the patient remembered eating chicken two days before admission but did not recall swallowing the bone.

Postoperatively the patient's course was uneventful with rapid recovery, marred only by increase in severity of her symptoms of osteoarthritis.

COMMENT

This patient presented many of the features mentioned in the literature - Failure of recognition of the object ingested,

possibly due to dentures the crampy pains followed by symptoms of peritonitis and the history of a laxative all fit in with the usual course of events In retrospect it is possible that with a higher index of suspicion the bone would have been noticed on the roentgenogram the diagnosis made and the operation performed at once

SUMMARY AND CONCLUSION

Sharp foreign bodies perforating the gastrointestinal tract may be the cause of generalized peritonitis or localized abscess This process often occurs in the absence of any history of swallowing a foreign body A preoperative diagnosis is seldom made unless the patient knows he has swallowed a sharp object Laxatives are contraindicated in patients suspected of having swallowed foreign bodies A higher index of suspicion is urged

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Low Maternal Mortality

Maternal mortality throughout the United States has been reduced from 79.9 per 10 000 births in 1920 to 20 in 1945 and to the low figure of 7 in 1952 Physicians are striving however to reduce this percentage still further During the last eight years from 1945 to 1953 14 501 mothers have been delivered at Seaside Memorial Hospital in Long Beach Calif without a single maternal death from obstetrical or any other cause Seaside Memorial Hospital is a 370-bed general hospital with a 40-bed obstetrical service The patients were cared for by more than 118 physicians 35 of whom were interns The 14 501 deliveries include 731 cesarean sections an incidence of 5 percent The average maternal death rate throughout the United States for this same period was 12.9 per 10 000 births or 18.7 deaths in 14 501 deliveries

—STIRLING PILLSBURY M D

i C l f M d p 343 Nov 1953

MECKEL'S DIVERTICULUM

Report of an Unusual Case

WILLIAM F HUGHES *Lieutenant MC USN*

MECKEL'S diverticulum is the most common developmental abnormality of the intestinal tract. According to Shallow and his associates¹ and Bigelow and Clark,² it is found in 1 to 2 percent of all autopsies. About 25 percent of the persons with this anomaly become symptomatic or have complications during their life, the average age for its clinical discovery being 25 years.

The complications of Meckel's diverticulum are inflammation, ulceration, intestinal obstruction, intussusception, torsion, hemorrhage, presence in a hernial sac, and tumor or fistula at the umbilicus.

The diagnosis is usually made at operation, as only 25 percent of the patients with Meckel's diverticulum have symptoms. When present, the symptoms and signs may simulate acute appendicitis or intestinal obstruction.³ Occasionally there is bleeding, which is a very serious complication, particularly in infants or young children. Bleeding from the lower bowel, often severe in amount and lacking other demonstrable cause, is most apt to be coming from a Meckel's diverticulum even in the absence of abdominal complaint. Rarely, there is noted a red dened area in the umbilicus which may represent an opening of the vitelline duct and by means of which the diagnosis may be made by injecting opaque media.

During surgical intervention, should the cause of the patient's symptoms not be found, a diligent search should be made for a Meckel's diverticulum. It should be removed, providing the patient's condition is satisfactory or if it is an incidental finding during other procedures unless there are contraindications present such as severe acute inflammation of another structure, poor-risk patient, or metastatic malignancy.⁴

The recommended procedures are to clamp the Meckel's diverticulum at its neck, remove it, and suture the defect, or

resulting defect in the antimesenteric surface of the ileum was closed transversely with two running loop on the-mucosa sutures of No 00 chromic catgut. The attachment of diverticulum to the anterior abdominal wall was severed immediately beneath the umbilicus the resulting defect being closed with mattress sutures of No 0 chromic catgut, and the abdominal incision closed in layers.

The postoperative course was complicated by the development of a wound abscess which required incision and drainage.

The pathologic report showed the Meckel's diverticulum (fig 3) to be 10 cm in length and to be patent to within 1 cm of the distal end. There was no aberrant tissue noted within the lumen.

DISCUSSION

Such a long history of intestinal obstruction (66 hours) confirmed by physical findings of distention, palpable loops of bowel indenting the anterior abdominal wall, roentgenographic evidence of dilated loops of small intestine separated by fluid, and operative findings of turbid fluid in the peritoneal cavity but with no gangrene of the intestine is difficult to understand. Probably the obstruction was incomplete until 24 hours prior to surgery. The paucity of complaints and symptom elicited from the patient is unusual.

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Adequate Diet for the Aged

The tendency to anorexia in old age is a phenomenon deserving further study. While it is not yet clear what percent of old patients exhibiting general weakness in the absence of demonstrable disease is due to prolonged malnutrition, certainly the importance of an adequate diet as a prophylactic measure against senile debility deserves emphasis.

—F m h trit R v ew p 273 Sept 1953

A Message From the A M A

EDWARD J. McCORMICK, M.D.
President, American Medical Association

It is a distinct pleasure for me to announce the beginning of a regular series of articles in the United States Armed Forces Medical Journal entitled "A Message from the A M A." In this first issue I wish to explain why this column has been initiated and the material it will cover. In addition, I want to express my sincere thanks to Dr. Melvin A. Casberg, Assistant Secretary of Defense (Health and Medical), Colonel Robert J. Benford, the editor of the *Journal*, and to all others who are making this series possible.

It became clear to me shortly after I was installed as the President of the American Medical Association, that there was a need for closer communication between organized medicine and the physician in uniform. The many letters which I received from men in service and the military developments in Korea and other parts of the world recalled to mind some of my own reactions while in uniform.

I remember as well any man who has been in service, the feeling we all experienced that we were "out of touch" and that we were being forgotten by our friends and colleagues at home. Upon checking with the Association's Council on National Emergency Medical Service, I found to my satisfaction that physicians in the armed services have not been forgotten or neglected by their national professional society.

Since its activation in 1947, the Council has maintained a close and constant liaison with the armed services and with the Department of Defense and has engaged in a series of projects all designed to benefit the physician in service and to insure the highest quality of medical care for military personnel. After further discussion it was agreed that a method should be devised to facilitate the communication of this information to the individual doctor in the service.

I originally suggested that the Council publish and distribute a monthly newsletter to keep physicians in the armed services fully informed as to the activities of the Association in their behalf and on current developments in the various fields in which they are interested. Administrative difficulties and security

regulations made this approach unfeasible. Consideration was also given to dedicating a section of the *Journal of the American Medical Association* to the subject; however, the limited nature of its circulation to service personnel suggested the need for another approach. It was then that an offer was made to permit the use of the *United States Armed Forces Medical Journal* for this purpose.

Beginning next month and each month thereafter the Council on National Emergency Medical Service will outline one of its projects, present a subject of current interest to physicians in uniform or answer questions which have been submitted. To a large extent the items discussed will depend on the nature of inquiries currently being received by the Council. Therefore if there is any subject which you would like to have discussed I suggest that you write directly to the Council on National Emergency Medical Service, American Medical Association, 535 North Dearborn Street, Chicago 10, Ill.

You appreciate I know that the views expressed in this and later editions of the column are those of the American Medical Association and not necessarily those of the armed services or the Department of Defense.

I know I speak for the Council and for all of the officers of the Association in pledging continued active interest in medical military affairs in the immediate and postservice problems of physicians in uniform. If there are ways in which you believe we can be more effective in fulfilling our obligations in this regard let me assure you that your suggestions will be most welcome.

An electron within the cancer cell remains the only goal of radiation but the new avenues of research which have been opened by the rapidly increasing number of radioactive isotopes have greatly enhanced the marksmanship. There is still work to be done in investigation of ray emitters which will destroy tumor cells only, finding a way to produce more even distribution of radiation within the tumor and extensive clinical investigation in use of supervoltage treatment. Radiation therapy is playing a great part in the battle on cancer. It is constantly opening new avenues for successful treatment of the disease.

—GILBERT J. FLETCHER, M.D.
C N w p 8 J 1953

Official Decorations

SILVER STAR

Daniel W Cl k *Lt. (jg) USNR*

William R Down y II *First Lt. MC USA*

LEGION OF MERIT

William W Ayres *Comdr MC USN*
 Robert A Byc Jr *Col VC USA*
 Joseph D G c m *Lt. Col MSC USA*
 Ray V Gewe *Lt. MC USNR*
 Eugene R. H r g *Capt. MC USN*

Warre E Kl n *Capt. MC US*
 William E Ludw ck *Comdr DC USA*
 Geo g M. P well *Col MC USA*
 Carl J Welg *Lt. Col MC USA*

NAVY AND MARINE CORPS MEDAL

Samu l A Youngm *Lt. (jg) MC USNR*

SOLDIER S MEDAL

G ld S Modj k *First Lt. MC USA*

BRONZE STAR MEDAL

Joseph L Ack m *First Lt. MC USA*
 Th rw ld R A d n *Maj MC USA*
 Robert E B k *Capt MC USN*
 W lt c C B yn *Capt. DC USA*
 J ph J B ll Jr *Capt. MC USA*
 Re f rd C. B g ll *Capt. MC USA*
 J h A B *First Lt. MSC USA*
 Har y E B w Jr *Capt. MC USA*
 Jame B B tl *Capt. MC USN*
 Gl nn R. Carw ll *Capt DC USA*
 E Ch w ke g L m *1st Lt. MC USA*
 Georg O Cl fi rd *First Lt. MC USA*
 Ramo L C ll *First Lt. DC USA*
 Edw n B Coyl *Capt. MC USN*
 Joh F Cur *Lt. (jg) MC USNR*
 L o t Del y J *Lt. (jg) MC USNR*
 R bert L Dow *Lt. (jg) MC USNR*
 Lyl H. Ed l bl t *Lt. Col MC USA*
 El beth T F halsky *Capt. ANC*
 Jame F F tch *Lt. (jg) MC USNR*

Roy N Fo ch *First Lt. MC USA*
 John W G dd *First Lt. MC USA*
 D ld R G lberr *Capt MC USA*
 Har old E Graham *Maj MSC USA*
 Ro c Gutkun t, *Lt. MC USNR*
 Henry L Hammond *Capt. MSC USA*
 Wilburn C. Hawkin *First Lt. MC USA*
 Cal M. H g *First Lt DC USA*
 Ferr G Hodg *Lt. Comdr DC USN*
 R ymo d L Hyd r *First Lt. MSC USA*
 R yce V J k *First Lt. MSC USA*
 Howa d A J hn n, *Comdr MC, USN*
 E t ll E kal k *Lt Comdr NC USN*
 L wre ce O ke l *CWOHC USN*
 Cl t s E King *Capt. MSC USA*
 Willi m A Ko nblum *Lt. (jg) MC USNR*
 Will m E Lar e *Lt. (jg) MC USN*
 J ph B L gr d *Capt. MC USA*
 Ll yd T L rbe *Capt MC USA*
 Thurlow W Matt *2d Lt. MSC USA*

This new feature is inaugurated in this issue as a regular department of the *Journal*. The names of officers of the medical service who have been awarded decorations by the United States Army Navy and Air Force since the beginning of the Korean campaign will be published following receipt of this information from official sources.—Editor

BRONZE STAR MEDAL—Continued

Chal D Mull Lt (jg) MC USN
 J h G M J C I MSC USA
 D w y A N I Fir t Lt MC USA
 R be O l k f Fir t Lt MC USA
 Will m A. P y M J MSC USA
 R be E. P ge Lt (jg) MC USN
 Har ld P in Capt DC USA
 Jam K P p Capt MC USA
 Har ld D R ha d Capt DC USA
 P G R bb Lt MC USNR
 R ym d A. R m k Capt MC USA
 And w J Sa ch Lt (jg) MC USNR

R be S h k M J MSC USA
 J A. S d y F t Lt MC USA
 J m G S Fir t Lt MC USA
 Ralph B Sm b Maj MC USA
 Ar hur H. S J Lt (jg) MC USN
 G lbe B Str g Fir t Lt MSC, USA
 Emn N Th m J Capt MSC USA
 R cha d P Turk Capt MC USA
 J hn H W i h Fir t Lt MSC USA
 Cha l M W Fir t Lt MSC USA
 R cha d E W i Fir t Lt MC USA
 Mart Zu k f Fir t Lt MSC USA

AIR MEDAL

Sh m H B k Lt (jg) MC USN
 Cal T Doud Comdr MC USN
 D nald D H l Lt MC USNR

H w d A J h Comdr MC USN
 L P K kp tr k Capt MC USN
 Warr E K l Capt MC USN

COMMENDATION RIBBON

Will m C Ad m J Lt (jg) MC USN
 J m A. Add Comdr MC USN
 Alth E Allg Lt AC, USN
 R y J A k F t Lt MC, USA
 Will m H B CWOHC USN
 J h F B Capt MC USA
 J h O Boo h Comdr DC USN
 L R. B gg J Lt (jg) MC USN
 Albe S Burk Lt Comdr AC USN
 D L Carl i Lt (jg) MC USNR
 S h J Chapma Lt AC USN
 Thoma L Cur Fir t Lt MSC USA
 L E D Lt MSC USN
 R be A D h ld Capt DC USA
 R ph i H Dun Capt MC USA
 P ul J Elk w Capt MSC USA
 J h H E F t Lt MC, USA
 Eva S. F rr g u. Lt (jg) MC USNR
 J h A G z, Fir t Lt MSC USA
 R be B G l J Fir t Lt MC USA
 R be H. G gg Lt MC USNR
 Edw d F Gudg l Maj MC USA
 J ph M. H Comdr MC USN
 Arr T H d son, Lt Comdr MC USN
 R ym d L Hor n, Second Lt MSC USA
 Bur C. J h so Lt MC, USNR
 F k F K l huk Lt Comd MC USA
 Donald C. h t, Lt (jg) MC, USN
 J F h. g Lt Comd DC USN
 Georg E. h kp tr k Capt MSC USA
 Carl J Koeh Lt Col MSC, USA
 Raymond J Kr us Lt (jg) AC USNR
 Que L L Fir t Lt MSC USA
 R y H. L dbe et J Lt MC USNR
 Thom C. L inbach Lt (jg) MC USNR

R ha d E L h Lt MC USN
 Ern J M g F t Lt MSC USA
 R be L Mar k Lt (jg) MC USNR
 Mal lm D M G y Lt MC USN
 R h d C M l k Lt (jg) MC USNR
 P ul M M h l Lt (jg) DC USNR
 Geo g C. Mort Fir t Lt MC USA
 R y B M l Lt DC USN
 Jam B N l Lt (jg) MC USNR
 Cha l W O Be CWOHC USN
 Wall R P ull Fir t Lt DC, USA
 P ul B P y Fir t Lt USAF (MSC)
 Ralph L P l Capt MSC USA
 R ha d C P w Lt (jg) MC USNR
 L u E R Comdr MC USNR
 D k E R d WOJG USA
 Clff d H R Comdr DC USNR
 J h T R gets Lt (jg) MC USNR
 Elm J Sch w J Lt (jg) MC USNR
 Ph ll p Sch d Lt (jg) MC USNR
 H ld S Shul Lt (jg) MC USNR
 M L Sl mow F t Lt MSC USA
 E A. S edd Lt MC USN
 Ver C So Capt MSC USA
 R g R Star Fir t Lt MSC USA
 Har ld S ma F t Lt AC USA
 Edw C T t Lt MC USNR
 L u W T y J l t Lt MSC, USA
 J ph O M. Tha b Comdr MC USN
 K ne h J T hol Fir t Lt MSC USA
 Rober B T be Lt (jg) DC USNR
 H nry O T wbe dg Lt (jg) DC, USNR
 F nk D v g l Comdr MC USA
 Daryl A W d Lt MSC USN
 R be t H W d Comdr MC USN

COMMENDATION RIBBON—Continued

Herbert B. Warrick WOHC USN	Jame M. Wilson Capt. MC USA
Frank Y. Watson, Lt. (jg) MC USNR	Edward R. Woodard Lt. MC USNR
William H. Weitzel Lt. MC USNR	Belton J. Witkman Lt. (jg) MC USN
William W. Wilkins First Lt. MC USA	Pule Zeigler Lt. (jg) DC, USN

PURPLE HEART

William A. Boyso Capt. MC USA	Samuel R. Frazier First Lt. MC, USA
Harry H. Clark Jr. First Lt. MC USA	Erk Lars Capt. MC USA
Ambrose H. Clement, First Lt. MC USA	John C. McKick Col. MC, USA
Ramon L. Collins First Lt. MC USA	Bert E. Smith Second Lt. MSC USA
Nicholas Comitos 2d Lt. MSC USA	Milton H. Stein First Lt. MC USA
Donald A. Degler Second Lt. MSC USA	Joseph Suchanski Second Lt. MSC USA
Raymond N. Duggan, First Lt. MSC USA	

Responsibilities of an Officer

The professional military man has three primary responsibilities. First to give his honest fearless objective professional military opinion of what he needs to do the job the Nation gives him. Second if what he is given is less than the minimum he regards as essential to give his superiors an honest fearless objective opinion of the consequences as he sees them from the military viewpoint of this shortage and third and finally he has the duty whatever be the final decision to do the utmost with whatever he is furnished.

—From remarks by General MATTHEW B. RIDGWAY USA
on assuming the duties of Chief of Staff U S Army

For this generation there is no sane alternative but to accept with courage and determination the realities of a new era. The time for courage and determination and action even it may be for martyrdom is now the place is here wherever we may be and whatever our responsibilities at the moment. Every action every word works for or against the great ideal of peace on earth. We the peoples of the world not only in the councils of the nations but far more importantly in our daily living will decide whether we and our children will live and die in misery and fear far worse than anything we have known or whether we and they can construct and enjoy a happy and peaceful world community. Again the time for action is now!

—Dr. BROCK CHISHOLM

in *Chronicle of the World Health Organization* p 188, Aug 1953

Teaching or Stagnating

It is unfortunately true that in many teaching institutions participation in the teaching program is a prerequisite to professional advancement. It is also true that there are many highly qualified physicians whose interest in teaching is negligible. If these men are forced into a position of teaching or stagnating they will choose the former. But it would be unrealistic to expect brilliance or even competence from their performance. Teaching is too demanding a task to be assumed casually or irresponsibly. If it suffers because of this then the blame must fall on administrators. This is a problem that requires the most careful consideration. Re-examination of local ground rules in the light of the requirements for successful teaching and the time and pain necessary for its accomplishment might result in significant improvement.

—GEORGE E. MILLER, M.D.

Disasters of the Chiropractor p. 454 Oct. 1953

Accidents Among the Aged

Accidents are a major threat to the life of the aged, outranking every other cause of death except the cardiovascular diseases and cancer. Of the 100,000 deaths from accidents in the United States annually about 25,000 occur among people at ages 65 and over. These elders thus contribute one-fourth of all the victims of fatal accidental injury although they comprise only 8 percent of the total population. The death rate from accidents reaches its highest level at ages 65 and over where it is three times the rate at ages 45-64 and seven times that at ages 1-14.

Physical weakness, impaired motor function, forgetfulness, poor vision and other infirmities of later life make the aged particularly prone to mishaps. Moreover, when these people are involved in accidents the results are likely to be serious. At the older ages bones break rather easily and do not join very readily; burns, cuts and other types of injury do not heal rapidly. In addition, serious complications such as pneumonia may set in while chronic disease—common among the aged—may have a fatal termination.

—STUART I. BLITZ p. 5 Oct. 1953

Regular Medical Corps Officers Certified by Specialty Boards

American Board of Dermatology and Syphilology

This board was activated in 1932 to certify qualified physicians in this field of practice. The following 34 regular Medical Corps officers, according to the Offices of the respective Surgeons General, are diplomates in this specialty.

John W. Albritton, <i>Comdr USN</i>	L. slit K. MacClatchey, <i>Capt USN</i>
Charles D. Bill, <i>Capt USN</i>	J. mes F. Morrill, <i>Lt USN</i>
J. hn H. C. Comdr, <i>USN</i>	Myrl P. Mourund, <i>Lt Col USA</i>
Calvin B. Galloway, <i>Capt USN</i>	William N. N. w, <i>Capt USN</i>
Bert d. G. Geutg, <i>Comdr USN</i>	Ola d. S. Olse, <i>Lt Col USA</i>
Gordon E. Gifford, <i>Capt USA</i>	William N. P. pe, <i>Lt Col USA</i>
Robert L. Glina, <i>Capt USN</i>	G. org. Prazak, <i>Col USA</i>
F. nklin H. Gruter, <i>Col USA</i>	S. dn y. j. Ri, <i>Lt Col USA</i>
Edward F. G. dg, <i>Lt Maj USA</i>	V. n. R. Richmond, <i>Lt Col USA</i>
Marshall B. Guthrie, <i>Lt Col USA</i>	R. bert G. Thompson, <i>Lt Col USA</i>
Vinon H. H. Comdr, <i>USN</i>	Urban L. Thr m. H. Lt, <i>Col USA</i>
E. rl S. H. H. ger, <i>J. Lt Col USA</i>	Er. st. R. T. te, <i>Capt USA</i>
Robert S. H. gd, <i>Col USA</i>	John D. W. H. t, <i>Comdr USN</i>
V. tor R. Hurhma n, <i>Col USA</i>	Cl. de B. Wh. t, <i>Col USAF</i>
A. rl V. Ka, <i>Comdr USN</i>	Raym. d. M. William, <i>Col USA</i>
Lo. S. L. I. nd, <i>Col USA</i>	Syd. T. W. th, <i>Lt USN</i>
Ch. st. r. M. L. nd, <i>Lt Comdr USN</i>	
R. be. t. E. Ly, <i>Col USAF</i>	

American Board of Pediatrics

Since its establishment in 1933, the American Board of Pediatrics has certified a total of 4,529 physicians on 30 June 1953. These include the following 42 regular Medical Corps officers of the three military departments:

Joseph Allon, <i>Capt USA</i>	Arld J. Cap t, <i>Capt USA</i>
George R. Barn, Jr, <i>Capt USA</i>	H. go M. Cardull, <i>Capt USA</i>
B. dfo d. H. Be. ey, <i>Capt USA</i>	Th. m. s. E. Co. e, <i>Comdr USN</i>
F. d. rick C. B. h, <i>Capt USA</i>	B. er. ard I. Coppl, <i>Lt Col USA</i>
Ogd. C. Bruto, <i>Col USA</i>	William W. Curren, <i>Lt Col USA</i>

The following officers of the American Board of Pediatrics and Neurology will be published in the February issue:

American Board of Pediatrics—Continued

Th m L Duffy *C mdr* USNJ h A Dugg *Capt* USAW lt M Edwa ds *Lt C I* USAJ h P F u r b l d *M j* USAAlb Geda *h Lt* USNLe J Gepp *Lt C I* USANoem Gold *Capt* USAH ld L Gua d *May* USAArv T H der *Lt C mdr* USNJ om Imburg *Lt* USNM l Kur k *Comdr* USNC L Milbur *J C I* USAJoe E M h l l *Capt* USAE R Moell *C mdr* USNWilliam I N kurk *Lt C mdr* USNJ ph R N wt *M j* USAR bert F N wt *Capt* USAJ h A Norma *C pl.* USAR h d E Ogbo *Capt* USAAl d C P t *May* USAFJ h F Shaul *Comdr* USND d W Sh rw od *C pt* USNF d i E Simp on *Lt C I* USAMay E St ah m *Capt* USADa l St w *Capt* USAF k L Sw l *Capt* USAJ hn C. T ugh *C mdr* USNCh M Tos ma *Lt* USNW l B W son *May* USAD k D W t l *Capt* USASh l J W t *C pt* USNW llam K. Wooda d *Lt* USN

Early Use of Forceps in Obstetrics

The invention of the forceps was probably the most important event in the history of obstetrics for dissemination of knowledge of the instrument coinciding as it did with the first serious incursions of the medical profession into the realms of midwifery gave the supremacy to the man midwife and afforded him for the first time opportunities for the study of normal as well as abnormal labor—a study from which all modern knowledge has come. So great an advantage did this instrument give the obstetrician of two centuries ago that it became hated by the midwives who did everything possible to discredit it in the eyes of parturient women. It was this attitude which prompted Smellie and others of his day to use wooden or leather covered forceps which being devoid of a tell tale metallic rattle could be applied surreptitiously without the knowledge of either patient or handywoman.

—T N A JEFFCOATE M D

But *h M d l j urnal* p 4843 Oct 31 1953

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R l J L Col USAF (MC) Impor nd l on f preve trv m d an t
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Sch lihamm W R J Cap MC USA F tal myoca d l of t on y g ma
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Stiff D W S M, MC USA nd Pow H G M. C I MC USA Roe tg l g
bse t on h mot hag f Rad ology 61 807-813 N 1953

Tac E. R Cap MC USA C iz tr tme f i c b gra l ma A M
A Ar h. Dermat & Syph 68 586-588 N 1953

Deaths

ENGELBREIT J ph J me Capta USAFR (MC) Thud Med c l G p
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BOOK REVIEWS

Diseases of the Liver Gallbladder and Bile Ducts Volumes I and II by *S S Lichtmann, M D* 3d edition revised 1 315 pages 220 illustrations and 3 color plates Lea & Febiger Philadelphia Pa 1953 Price \$22 for the set

This is an extensive, excellent, and detailed compilation of the most recent data on all phases of liver disorders. The material is collected from world wide contributors and the references are voluminous after each chapter. Over 200 pages are devoted to a discussion of cirrhosis of the liver alone. The presentation of the various types and forms of liver function tests and procedures is especially clarifying. Liver aspiration biopsy is discussed in a short but comprehensive chapter on general considerations in differential diagnosis of liver disease.

One hundred pages are devoted to viral hepatitis as part of an especially good chapter on the acute and subacute inflammatory diseases of the liver. Liver dysfunction as manifested in such diseases as hyperthyroidism and other metabolic disturbances, and in heart disease is presented in excellent manner. Liver function during various stages of pregnancy and its complications is also outlined. Because the liver is such a large and important organ, this fine work takes up that subject primarily. However, the 12 percent allotted to discussion of the gallbladder and the biliary tract is very interesting and practical to the surgeon as well as the internist.

This set of two volumes is a valuable reference work for the studious medical internist as well as the gastroenterologist.
—*Col U R Merikangas MC USA*

Differential Diagnosis of Common Diseases of the Eyeground by *Paul Tower* 243 pages illustrated Grune & Stratton Inc New York N Y 1953 Price \$10

There are a number of features that commend Dr Tower's new textbook to students and practitioners of medicine and particularly of ophthalmology. In the first place, its size (7 by 10 1/4 inches 243 pages) binding (light green library buckram) paper (medium gloss) and type (12 point standard) make it a comfortable book to handle and use. Its format is attractive, and it is well indexed. Secondly, its text is faithful to the teaching of the dif

ferential diagnosis of common diseases of the eyeground and its method direct In the third place the descriptive handling of normal anatomy and its deviations in disease is clear concise and adequate for teaching Finally the diagnostic inferences that are drawn from ophthalmoscopic evidence of structural changes in the eyegrounds are cautious and conservative where they attempt evaluation of systemic disease

The text commences with a consideration of the normal fundus and discusses congenital anomalies before considering specific diseases of the retina choroid macula and optic nerve One chapter is devoted to glaucoma Photographs of fundi in black and white are used freely often in contrasting pairs By this arrangement apparently similar conditions are presented in a manner that permits easy explanation of common and distinguishing features Legends are arranged in columns beneath each of the prints to provide a point by point consideration of salient differences This parallel consideration of differences remains a forceful teaching device The use of color photographs in place of black and white would obviously be excessively expensive Bibliographic support of statements is extensive and each subdivision of a subject is followed by a "literature discussion" In these sections the more pertinent of the references are synopsized and the bibliography becomes more meaningful The value of this book lies in its lucid readability and in its effective presentation of diagnostic considerations In this area it can be classed as superior to many of the similar textbooks for medical students and interns in ophthalmology Nonophthalmic practitioners should find it a most instructive aid to recognizing and understanding eyeground changes The book offers more advanced students and practicing ophthalmologists a well organized review of the differential diagnosis of common diseases of the eyeground and a means of rapid reference to specific subject matter —Comdr E A Hynes MC USN

Nutrition in Health and Disease by Leon F. Cooper B S M A Sc D
 Edited by M. Barber B S M S Helen S Mitchell A B Ph D and
 Hendrika J. Ryberg B S M S 12th edition 790 pgs 130
 illustrations 5 color J B Lippincott Co Philadelphia P
 1953 Price \$4.50

The publication of this new edition marks the completion of a quarter century during which this textbook has been recognized as an outstanding teaching guide and standard reference in this field It has been completely revised and brought up to date to reflect the rapid progress made in the science of nutrition by the practical application of research during recent years

In the section on principles of nutrition the authors emphasize normal metabolism and nutrition throughout the entire life

span and discuss regional, national, and cultural food patterns and the significance of nutrition as a national and international issue today. The chapters dealing with "Diet in Disease" have been revised in accordance with currently accepted methods of the dietary management of the sick. The chapter on obesity has been rewritten and is particularly helpful in its practical approach to this problem.

The revised section on food selection and preparation coordinates the discussion of foods and their preparation in an adequate, concise, and readable manner. A new chapter on therapeutic diets with special attention to low sodium recipes and a table on the cholesterol content of food have been added and there is a glossary of scientific terms and an excellent list of selected references.

The material in this textbook is primarily designed to meet the needs of the bedside nurse, but it is also of value as a reference for the public health nurse, the doctor, and the dietitian or the nutritionist, especially to those engaged in teaching subjects in this field — *Col M E Perry USAF (WMS)*

Handbook of Treatment of Acute Poisoning by E H Bensley M B E B A M D and G E Joron B A M D C M 201 pages Renouf Publishing Co Ltd Montreal Canada 1953 Price \$2.50

The primary purpose of this handbook is to help the physician who has had no special experience in toxicology when suddenly called upon to treat patients with acute poisoning. Its secondary purpose is for use in teaching the management of acute poisoning to students of medicine, nursing, and first aid.

The simplicity of arrangement of the information is admirable. One section deals with basic principles and the general plan and methods of treatment. A second and larger section lists alphabetically the common types of acute poisoning and their treatment. Emphasis in chronologic order on lifesaving measures is clearly given. The names of 39 groups of acute poisons, each followed by an extensive listing of component drugs and chemicals by common, technical, and trade names, serve as the headings for detailed descriptions of clinical management. These are all cross indexed. As the first paragraph of the book points out, an exact knowledge of the poison involved is not prerequisite to prompt and effective treatment.

This compact and up-to-date handbook is highly recommended for the training course, the reading shelf, and the emergency room, where interns or others may receive calls for assistance in cases of acute poisoning — *Lt Col R L Cavanaugh, MC USA*

Current Problems in Psychiatric Diagnosis edited by P I H H b M D and
J s ph Z b n Ph D 291 p g ill trat d Gr & Stratt I c
New York N Y 1953 Pr \$5 50

This publication contains the proceedings of the forty first annual meeting in 1951 of the American Psychopathological Association and covers a wide variety of topics of current interest. Papers are presented by 24 authors and discussants and each article is a searching documentary of present thinking. The presidential address by Dr Lauren H Smith "The Responsibility of Psychiatry," is one which could be read with profit by all psychiatrists. The section of Nosology and the Law by Dr Fred V Rockwell is thought provoking and timely. Dr Nathan W Ackerman's paper on Psychiatric Disorders in Children presents his modification of Brown Pollock and Potter's etiologic classification emphasizing his opinion that the personality of the child should not be dissociated from the environment and that the classification guide should be a faithful portrayal of the individual patient in action. This book is recommended to the psychiatrist for inclusion in his library as a worth while addition to current literature —Capt T P Rogers MC USN

Nomenclature and Criteria for Diagnosis of Diseases of the Heart and Blood Vessels by The Committee for the New York Heart Association
I H l d E B P de M D Ch rma A thur C D g Jf M D
Cl E d la Ch p ll M D C ry Egg l t M D Ch l E
K mann M D Edw P Maynard J M D J b B S h w d l M D
H old J St wa t M D nd lrv g S W ght M D 5th dit 359
pages ll trat d N w Y k H rt A t I N w Yo k N Y
1953

This is the fifth edition of a handbook first published in 1928 and sponsored by the American Heart Association. For the first time it includes a section concerning diseases of the peripheral vessels. The discussion of congenital heart disease has been expanded and the sections on roentgenologic, electrocardiographic and pathologic diagnoses have been revised.

A new term "innocent murmur" is introduced as a substitute for "functional murmur." The terms "potential heart disease" and "possible heart disease" have been replaced with "no heart disease predisposing etiologic factor" and "undiagnosed manifestation" respectively. The word "atrial" has been substituted for "auricular."

The book includes much useful information for the internist and cardiologist. Every physician will improve his diagnosis of cardiac diseases by including an etiologic, anatomic and physiologic diagnosis plus the cardiac functional capacity and the patient's therapeutic classification as outlined in this book.

—Col R P Johnson MC USA

Injuries of the Spinal Cord edited by *George C. Prathe* M D F A C S and *Frank H. Mayfield* M D F A C S 396 pages illustrated Charles C Thomas Publisher Springfield Ill 1953 Price \$8.75

Any physician caring for a patient with an injury of the spinal cord should read this book, and all hospitals should have it in their library. It is an excellent, well organized collection of ideas and information vital to the proper understanding and care of these unfortunate but not hopeless people.

For convenience, the book is divided into sections, each concerned with a special aspect of the problem and each written by a man specialized in his field and obviously well acquainted with the unusual problems presented by the total or partial paraplegic. A historical note is followed by the neurosurgical, urological, nutritional, and orthopedic sections and there is, appropriately, a chapter on associated injuries and complications. The treatment of decubitus ulcers is described in a separate division. Rehabilitation and psychological considerations of the patient as a whole complete the discussions. These separate sections, written by different men, are brought together in unity, as the care of the patient must be.

Dedicated to the Military Personnel of the United States Forces, who during World War II received injury of the spinal cord, this book stands as a tribute to them. It stands also as a tribute to the doctors who, so poorly informed as to these patients' care at the beginning of that conflict, learned much. This summarizes for future reference one of the most important medical and surgical advancements of that war—*Lt. Comdr F. B. Clare MC, USN*.

Surgical Pathology by *Lauren B. Ackerman*, M D 836 pages with 913 illustrations The C. V. Mosby Co. St. Louis Mo 1953 Price \$14.50

I agree with the author's preface that this book is only an introduction to the vast field of surgical pathology. Most chapters are largely devoted to the discussion of tumors, their pathology and their treatment. Frequently the description of non-neoplastic disease is too brief.

Diseases are discussed by organ systems. As might be expected with a first edition, several errors in spelling and labeling are noted. Both gross and microphotographs are numerous and of excellent quality. The concepts of etiology, diagnosis, and treatment are up to date and the bibliography includes recent literature and could well be used to supplement the information given in the text.

This book is recommended for use by medical students and physicians interested in surgical pathology.

—*Capt. W. E. Thomas, MC USA*

The Team Plan A Manual for Nurses of Service Administrators by Dorothy Perkins Newcomb RN BS F word by Ruth Slipp RN MA
 L H D 82 pages illustrated G P P t m Son New York NY
 1953 Price \$1.50

Written in a concise yet informal style this manual is directed to administrators of nursing services. It is offered as one solution for the familiar problem of meeting increased demands for nursing care with minimum staffs of nursing personnel. The introductory chapter briefly but clearly reviews over all nursing service problems. The basic ideas of the team plan are offered in the second chapter followed by the effect of the plan on the nursing service and on the quality of nursing care rendered. The utilization of the student nurse and incorporation of other nursing personnel within this program is followed by a discussion of how best to implement the plan and of the resistance to change from established routines that may be expected.

The manual has much appeal with its realistic approach. It is evident that the author is well acquainted with nursing service situations and personnel problems. Some questions that may arise are how can one find sufficient "team leaders" with the necessary qualifications or how can diverse abilities easily be combined and directed toward the common objective. No clear design for the team plan for 24 hour nursing care is included but it is suggested that adaptations for specific nursing situations will have to be made. A challenge is presented by the manual to all those having difficulty in meeting present-day nursing care demands to try the team plan.—Lt Comdr F E Quebbeman NC USN

Copying and Duplication of Medical Subjects and Radiographs by H. L. G. b. n.
 75 pages illustrated Chapter C Thoma Publisher Springfield Ill
 1953 Price \$5

This small volume provides readily understandable instructions for the beginner in copying and duplicating medical material. It is also designed to serve as a summary for the experienced worker in the field of medical reproductions.

The copying of black and white originals and the duplicating of colored transparencies are well illustrated and described. Data are given on films that are most satisfactory for copying in black and white. Illustrations useful for copying colored originals are included to show the effects of different types of film and of contrasting filters. There is a chapter on the duplication of radiographs for projection exhibition or publication.

This book should provide a ready reference for those interested in copying or duplicating medical material for use as visual aids in teaching or for publication.

—Comdr V E Martens MC USN

Adrenal Cortex Transactions of the Fourth Conference November 12 13 and 14 1952 edited by *Elaine P Rall* M D 165 pages illustrated Sponsored by *Josiah Macy Jr Foundation* New York N Y Printed by *Foundation Press Inc* Packanack Lake N J Price \$3 50

Under the auspices of the Josiah Macy, Jr Foundation four conferences have been held in an effort to expand and integrate knowledge of the adrenal cortex This volume reports the fourth such meeting, and the discussants represent a large number of the outstanding workers in the field The following subjects are reviewed permissive action of adrenal cortical hormones, mechanisms through which the adrenal cortex produces qualitatively different effects evidence, nature and site of production of a salt hormone secreted by the adrenal gland, and adrenalectomy in man The first three subjects have limited interest for the clinician and are directed to physiologists and those internists in the field of endocrinology The discussion of adrenalectomy, however, is of current importance to both internists and surgeons and is highly recommended

The limitations inherent in any panel discussion are not entirely escaped in this volume The original point of discussion, particularly in the chapter on permissive actions, is incompletely expanded by virtue of a drift of emphasis to the general subject of stress As anticipated more provocative points are raised than can be discussed profitably in a short presentation

Upon completion of this volume the reader retains an accurate picture of the complexity of research in adrenal physiology, and great respect for the panelists and for their work

—*Lt D B Carmichael Jr, MC USN*

Ballistocardiography The Application of the Direct Ballistocardiograph to Clinical Medicine by *William Dock*, B S M D and *Robert A Mendelbaum* B A M D 293 pages with 153 illustrations The C V Mosby Co St Louis Mo 1953 Price \$9 50

A large amount of data on the physiology of circulation and respiration is given as background for the clinical discussion of ballistocardiography in this volume which is amply illustrated by large graphic diagrams The mathematical aspects of the subject are reduced to simplest terms and illustrated in appendices 1 and 3 The authors describe in practical detail the construction of their own types of simple photoelectric and electromagnetic ballistocardiographs A broader discussion of ballistocardiographs and technics is also included

Clinical application of ballistocardiography has been a natural result of the development of portable simple equipment The authors have satisfactorily organized and illustrated their clinical experience in normal subjects, and in patients with pulmonary dis-

eases acute myocarditis heart failure, coronary artery disease arterial hypertension, valvular heart lesions, conduction defects and cardiac arrhythmias The effect of tobacco smoking on the ballistocardiogram is included in the presentation The technic of reading and classifying the ballistocardiogram is fully described and the place of ballistocardiography in evaluating the cardiac patient is presented realistically The role of this technic in surgery, obstetrics industrial medicine and insurance examinations is emphasized An excellent bibliography is provided

This book lays the foundation for sensible clinical use of the ballistocardiogram It is important because of the number of physicians who are beginning to use this instrument Internists and cardiologists will find it of value —Col B E Pollock MC USA

Classics in Clinical Dermatology With Biographical Sketches by William B. Shelly M D Ph D and John T. C. S. y M D Introduction by John H. Stokes M D 467 pages Illustrated by Charles C. Thomas Publisher Springfield Ill 1953 Price \$10.50

This book is the fruition of an enormous amount of effort, as anyone will realize who has attempted to trace down an original medical description especially those involving foreign languages If for no other reason the authors would therefore merit a well done considering that they have presented 143 original versions of dermatologic entities

Primarily the offering will be of interest to dermatologists and especially to those having an interest in the origins and genesis of the speciality For these it is indispensable, giving as the authors state, every sentence exactly as the authors wrote it. In the translations where apparently there might be contention as to meaning, the foreign word is quoted, as well as the author's English equivalent Secondly, it will be of interest to other specialities because contributions to dermatology have been made by ophthalmologists surgeons pathologists and others, as is true of all fields of medicine Students will be intrigued by descriptions from as far back as 1757 which have never been improved upon No one will fail to be stimulated by the stature of the pioneers and their driving urge to guide through the medical maze

In the preface John Stokes highlights what the work most admirably sets forth that in dermatology and probably in other specialities the clinician is king Progress in medicine now as in the beginning arises from a painstaking study of the patient

The work is recommended unreservedly, not only as an invaluable source book but also as highly enjoyable reading material

—Capt C D Bell MC USN

The Neurophysiological Basis of Mind The Principles of Neurophysiology by John Carew Eccles The Waynflete Lectures Delivered in the College of St Mary Magdalen Oxford in Hilary Term 1952 314 pages illustrated Oxford University Press New York N Y 1953 Price \$6 50

This is a scholarly series of lectures by an unquestioned authority in the field of neurophysiology. It differs from most books on neurophysiology in that it is directed at psychiatry rather than neurology.

The book devotes its eight chapters to a fairly orderly and general development of some current concepts of "mind." It begins with a discussion of nerve conduction, proceeds to the synapse, and ultimately to neural organization of higher and higher complexity. Prolonged functional changes following repetitive use are crucial to the development of the book. As the author proceeds up the neuraxis, the material becomes somewhat speculative but expresses the current opinions of some of our foremost neurophysiologists. This speculation is quite justifiable inasmuch as the missing link between neurophysiology and psychiatry is a major one and is not really approachable by laboratory techniques in the same sense as conduction by a nerve fiber.

As is usual in discussing theories of mind, the final chapter, "The Mind-Brain Problem," becomes bogged down at times in semantic difficulties. The reaction to this will vary greatly from reader to reader, but should not greatly detract from the usefulness of the book because, relative to most works on mind, this is a masterpiece of clarity.

Considering the complexity of the task, the author's job is well done. The material is well introduced, elaborated, summarized, and documented. There are 88 appropriate figures. This book will be of interest to those who seek an up-to-date detailed account of the neurophysiologist's views on mental function that will not cause them to lose their way in anatomic and mathematical digressions. It is a wholesome approach and is highly recommended.

—Lt (jg) W H Oldendorf MC, USNR

Aspects of the Psychology of the Tuberculous A Psychosomatic Medicine Monograph by Gordon F. Deme Ph D 119 pages illustrated with charts Paul B Hoeber Inc New York N Y 1953 Price \$3 50

This monograph presents an intensive analysis of the personality factors in persons with tuberculosis. The major thesis is an inquiry into the hypothesis, often found in psychological investigations of physical disability and illness, that there is a characteristic "personality" which is typical of those who are handicapped in some physical way. Each patient was interviewed for from 8 to 10 hours with a single session usually lasting about half an hour. The

methods of psychologic appraisal included the use of clinical interviews standard psychometric tests rating scales, specially designed tests, and projective technics. The interviews made use of a controlled interview schedule which covered the attitudes and feelings of the tuberculous patient toward the disease the diagnosis the symptoms the treatment and the effects of the disease on the person's life. The author reports on these attitudes feelings and personality characteristics of hospitalized tuberculosis patients with considerable verbatim extracts which permit a detailed view of the psychologic aspects of the tuberculous. It is these factors in the tuberculosis situation which clarify Osler's suggestion that what happens in the patient's head is more important than what happens in his chest.

The present study as well as the very few other investigations into the psychologic characteristics of tuberculous patients have not produced very clear cut results. Some of the author's findings reveal that there was no unique tuberculous personality but there was a wide variety of disturbed behavior. * The most frequent emotions were fear apprehension and depression. The major activities of the patients were reading handicrafts and radio listening. These observations help explain why rest is the basic ingredient in the treatment of tuberculosis which ideally means relaxing mentally and emotionally as well as physically. This monograph should be of value to anyone interested in tuberculosis whether he or she be nurse physician social worker, psychologist or worker in the general field of psychosomatics.

—Lt Col F Killian Jr USAF (MSC)

A Guide to Human Parasitology for Medical Practitioner by D B Blacklock
M D (Ed) D P H (Ld) D T M (L) d T S thw II
D S Ph D R d by T H D y M D (Bell) D T M (L)
5th ed: 228 page with 3 color plates d 120 illustrations
t t Th William & Wlk C B tumor Md 1953 P c \$5 50

Diagnosis and treatment of illness due to parasitic infections depends upon identification of the parasite or its eggs in a suitable specimen of feces urine blood, or other material. All physicians have had some training in these technics but because few feel confident of their ability to make an adequate examination of material for parasites they refer the problem to the clinical laboratory. Unfortunately most laboratory technicians dislike stool examinations and are inexperienced in the identification of any parasites they may find. This small volume will prove valuable to both the physician and the laboratory technician. The book is well written and illustrated the essential material is presented concisely and in such form that inexperienced readers may readily obtain the information sought. Only human parasites of clinical importance are discussed and the emphasis is on diagnosis.

Tables differential keys and excellent drawings are provided to assist in identification of parasites. Life cycles are shown diagrammatically. In and on to collections of intestinal parasites there are separate chapters covering sources of infections, helminths, malerial parasites and filariae. Brief summaries concerning prophylaxis and control measures have been added in this edition. Treatment is not discussed.

The parasitologist does not need this book, but most other physicians, health officers and laboratory technicians will find it very useful.—Lt Col E H Sullivan Jr, MC USA

Clinical Lapar Electrocadiography by Bernard S Lipman, A.B., M.D., and Edward Mittleman, A.B., M.D. 2d edition, 70 pages illustrated. The Year Book Publishers Inc., Chicago, Ill, 1963. Price \$7.50

The descriptive title of this book indicates the now widespread acceptance through popular usage, of the term "unipolar" to designate the technique in electrocardiogram of placing an electrode close to the heart with a stabilized indifferent electrode or with one distant from it. The authors objective in their first edition of producing a simple and practical manual has been retained in this edition of the expanded teaching booklet. New material has been incorporated on cardiac arrhythmias myocarditis and congenital heart disease. Minor changes have been made in the original chapters on physiologic principles electrical position of the heart, ventricular enlargement bundle branch block, myocardial infarction and abnormal electrographic patterns. While extremely basic and in some portions oversimplified the book is an excellent synopsis of the essentials in the field. Controversial theories are avoided or fairly presented. The excellent schematic diagrams especially in the section on myocardial infarction should greatly aid the beginner in these studies.

The section on illustrative electrocardiograms includes individual records clearly shown and uniformly and neatly mounted. Reference numbers to these in the text would enhance comparison to the diagrams shown. The bibliography, while complete would also aid the reader further in recognition if cross-referenced to the text. Perhaps the most important statement of the book is contained in the summary. It merits repetition on the top of every page for the beginner stressing the caution to be observed in interpreting the electrocardiogram as only a graphic representation of the electrical activity of the heart to be evaluated only when considered in the light of the patient's clinical course and laboratory data. This caution could well have been used in the authors' presentation of patterns of myocardial infarction in which anatomical localization is attempted.

—Brig Gen V S White USAF (MC)

Pharmacology and Therapeutics in Nursing by H. Sylva D. L. y. A. B.
 M. D. d. J. ph. Rapp. p. i. R. N. M. A. 2d. d. tio. 486 p. g. s.
 H. s. r. t. d. g. r. ph. d. charts. McGraw H. I. B. k. Compa. y. I. c. A. w. Y. k.
 N. Y. p. bl. h. 1953. P. ce. \$4.50

In this revision the use of drug therapy is correlated with nursing measures and many new drugs with their uses actions toxicity dosage technic of administration and dose forms are introduced The authors aim of contributing to total patient care planning is evidenced by the order in which the classes of drugs are included and by the sections within the chapters devoted to nursing This gives the nurse a clearer insight into the action of the drugs The subject matter proceeds from the background of the uses of drugs through the knowledge necessary for their administration to the specific drugs acting on different systems of the body This sequence contributes to the over all understanding of the nurse An especially interesting and useful feature is the outlining of the treatment of poisoning by the most common drugs This book will be very useful as a textbook or as an additional reference book for a professional library

—Lt Comdr A Burk MC USA

Psychosomatic Approach to Gynecology and Obstetrics by F. C. H. ng. f. M. D.
 Am. r. L. tur. S. i. P. bl. t. on N. mber. 164. A. M. n. graph. th.
 Ba. n. tone. D. f. Ame. i. L. r. s. i. Gy. ol. gy. d. Ob. t.
 ti. di. d. by. E. C. H. mbl. B. S. M. D. 346 p. g. Ch. l. C. Th. m.
 P. bl. h. Sp. ngl. ld. Ill. 1953. P. c. \$6.75

The author of this monograph is well prepared to present such a treatise as his training has included the field of psychiatry as well as that of obstetrics and gynecology In this particular book he is very much the neuropsychiatrist In his preface the author makes a plea for the return to the "art of medicine" which he believes can be easily passed over in this age of specialization He then defines at length his concept of psychosomatic medicine

The book is divided into six sections covering major and minor gynecology obstetrics special problems and psychotherapeutics The special problems of frigidity dysmenorrhea menstrual aberrations and the emotional disorders of puberty and the menopause are presented at length The chapters of preoperative and post operative care of neurotic patients present aspects of this problem easily ignored by the busy practitioner These specific problems are illustrated by approximately 50 actual case reports these cases however represent extreme neuropsychiatric problems normally falling under the jurisdiction of the psychiatrist rather than the gynecologist Of most value is the section on psychotherapeutics to which the author devotes three chapters written in an easily read yet concise fashion The bibliography lists over 500 books and original articles

Like most books dealing with a particular aspect of a speciality, or as in this case, an approach to it, this monograph is designed more as closely allied extracurricular reading than as study material for the student or busy practitioner

—*Lt Comdr C E Weber, MC USN*

Handbook of Dietetics for Nurses by Catherine F Harris S R N R C N
Foreword by Professor S J Couell M B F R C. P 196 pages 11
illustrated The Williams & Wilkins Co Baltimore Md publishers 1953
Price \$4

There has long been a need for a new dietetics handbook for nurses This carefully documented book has compact information for the student nurse and is a source of quick reference for the graduate nurse who may or may not be in the field of dietetics

The relationship between nutrition and health is pointed out simply and concisely, with emphasis on diet therapy in specific diseases and in states of impaired nutrition The complete science of nutrition is explained thoroughly and succinctly the outline form facilitating ease in learning The author introduces enough physiology into her explanations to enable the student nurse to correlate nutrition with body functions in health and disease Her comparative tables are compilations of good material

The author's choice of foods for discussion is naturally limited due to conditions in her country, but this is helpful because it would enable nurses to substitute food products in the event of a food shortage —*Lt A R Enger NC USN*

Human Embryology by Bradley M Patten, A B A M Ph D 2d edition
798 pages with 453 illustration The Blakston Co Inc N w York
N Y 1953 Price \$12

Although the second edition of this excellent textbook of human embryology appears only seven years after the first was published it incorporates notable advances in two distinct fields The more important of these concerns the development of the heart and great vessels A better understanding of developmental disturbances resulting in abnormalities in vascular pattern, or in congenital defects of the heart permits better surgical management of these conditions The related sections have been amplified and 12 new or improved illustrations added

The other field of great advance is in the knowledge of very early development and the initial phases of implantation, as they actually occur in human beings These sections have been rewritten to describe early stages as observed in human embryos recently obtained by Hertig and Rock, rather than as inferred from conditions in other mammals

The book is clearly written well illustrated and adequately indexed To the already extensive bibliography of the first edition has been added references to 260 pertinent articles that have appeared in the 1945-1952 interval This textbook should be useful to both medical students and physicians

—Capt B F Avery MC USA

Available by Roberts P H Ph D and J D / noy D S 2d ed
 on 398 pag 87 illustration included g pl t f l l c l o r
 J B L pp oct C Ph l d lph P 1953

The purpose of the authors of this volume is to "present in a succinct integrated plan the facts and principles of fundamental and permanent value relating to antibiotics This they have accomplished Since the first edition appeared in 1949 research and important discoveries in this field have been extensive In the second edition these discoveries have been considered in relation to facts and principles previously established some of which have had to be re evaluated The material of the earlier edition has been revised and five new chapters have been added

The historical background of the concept of antibiotics the natural sources of antibiotics the criteria for their identification and an explanation of the concept of antibiotic spectra make up the first chapter The biologic significance of fields of diffusion with the concept of threshold and optimal concentrations a discussion of antibiotics and chemotherapy and a list of requisites for an ideal antibiotic complete the section on the fundamental aspects of the subject.

Under industrial aspects the authors discuss production by fermentation and the screening and assaying of antibiotics The section on applied aspects deals in detail with the more important antibiotics and also discusses mixed antibiotic therapy This section includes chapters on antibiotics used in dental practice and oral surgery and in agriculture The latter concerns those used in plant pathology as growth stimulants and in food processing In the final part of the book the authors discuss resistant strains of micro-organisms mechanisms of antibiotic action and some of the present and future effects of the development of antibiotics on social and economic conditions

This book is an excellent presentation of the subject. The tables diagrams charts and appendices are helpful and the lists for suggested reading which conclude each chapter are well selected It is written from the scientific viewpoint with no attempt to popularize the material but it is not too technical to be comprehensible and interesting to the general reader

—Comdr R L Taylor MSC USA

Emergency Surgery Bernard J Ficarra M D Supervising Editor 1 000
pages 578 illustrations F A Davis Company Philadelphia Pa
1953

This text is not limited solely to surgical problems of traumatic origin as one might infer from the title. It is encouraging to find a book covering so much diversified material which continually stresses that emergencies in purely elective procedures may require more heroic measures to sustain the patient than in the severest traumatic problem. The 70 chapters are organized into regional and organic groupings and cover the span of emergencies from the prenatal to the geriatric period. Considerable material is also included on the management of casualties from bombings and similar catastrophes.

This book does not pretend to analyze completely each emergency problem presented because entire texts have been written on electrolyte balance, cardiac arrest, postoperative psychosis, massive gastrointestinal hemorrhage, and other emergency conditions. Several chapters are unusually well presented and one particularly worthy of note is that by De Palma and Snedden on "Acute Nonfracture Injuries of the Shoulder."

The young surgeon will find himself very well repaid by keeping this volume within reach during his active daily practice. It will broaden immeasurably his experience and help him to eliminate any "acts of omission" in his competent management of the surgical emergency.—*Col D Gold USAF (MC)*

Peptic Ulcer Pain Patterns Diagnosis and Medical Treatment by Lucian A. Smith M D and Andrew B. Ries M D 576 pages illustrated
Appleton-Century-Crofts Inc New York N Y 1953

The authors' objective in this book is to aid in the accurate diagnosis and satisfactory medical management of peptic ulcer disease. They take particular pains to describe the criteria for precise diagnosis of the various complications of the disease, and to outline the definitive therapy indicated for each complication. The major value of this volume lies in the clinical evaluation of various pain patterns in relation to the underlying disturbed pathophysiology, in particular that of penetration and perforation. There are excellent clinical observations on an adequate number of verified primary and postoperative recurrent peptic ulcers ranging from the esophagus to the ileum, and diagrammatic illustrations of the pain patterns in each case.

All aspects of the subject matter are given due consideration as evidenced by the chapter headings: history, anatomy of abdominal pain, pathologic anatomy, physiology, etiology, clinical history and physical examination, laboratory aids, etc.

ulcer gastric ulcer duodenal ulcer Meckel's diverticulum post operative peptic ulcer gastrojejunal and gastroileal ulcer hemorrhage obstruction free perforation subphrenic abscess endoscopic evaluation roentgenologic diagnosis and treatment of complications

This book is highly recommended to all surgeons internists and general practitioners for improving their diagnosis and care of ulcer patients —Comdr L J Pope MC USA

The Year Book of Medicine (1953-1954 Year Book Series) edited by Paul B. Szabo, MD, CI Mus. h. b. m. MD, Will. m. B. Ca. tl. MD, T. sl. y. R. H. n. s. n. MD, G. org. B. Eust. m. MD, d. R. b. t. H. Will. ms. MD, 736 pages, 11 illustrations, The Year Book Publishing Co., Chicago, Ill., 1953, P. \$6

This volume of the well known medical year book is a series of digests of important articles in the field of internal medicine which have been published during the current year. It is divided into six sections that include infectious diseases, the chest, the blood forming organs, the cardiovascular renal system, the digestive system and metabolism. Each part is edited by a recognized authority in his field and presents an excellent method of keeping abreast of important work done during the current year. Articles are reviewed from British, Canadian, Scandinavian and French publications as well as from this country, and are well chosen for their relative significance in the field of medical progress. Controversial subjects are presented from several points of view and the reader is urged to consult the original article for more detailed study. The editorial comments are numerous and enhance the value of the book. A separate index is provided for subjects and authors. Graphs are reproduced from the original article when indicated.

This volume provides a means for the busy internist to cover medical literature and is useful both as a ready reference to information and as a broad review of advances in medicine during the past year. On the whole it is a worthwhile addition to the library of the medical practitioner.

—Comdr A. M. Lacer MC USN

- Modern Clinical Psychiatry by *Arthur P. Noy* M.D. Superintendent, Norristown State Hospital, Norristown, Pa. Associate Professor of Psychiatry, Graduate School of Medicine, University of Pennsylvania, 4th dist. 609 page. W.B. Saunders Co., Philadelphia, Pa. 1953.
- Textbook of College Hygiene by *Oliver E. Byrd* Ed.D. M.D. Professor of Health Education, Stanford University. 443 page. Illustrated. W.B. Saunders Co., Philadelphia, Pa. 1953.
- Handbook of Differential Diagnosis by *Harold Thomas Hymas* M.D. Author of *An Integrated Practice of Medicine*. 716 page. J.B. Lippincott Co., Philadelphia, Pa. 1953. Price \$6.75.
- Periphral Nerve Injuries: Principles and Diagnosis by *Wesley Hymas* M.D. Chief, Neurophysiology Section, Armed Forces Institute of Pathology, Washington, D.C. and *Bernard Woodball* M.D. Professor of Neurosurgery, Duke University School of Medicine, Durham, N.C. 2nd edition. 333 page. 272 illustrations. W.B. Saunders Co., Philadelphia, Pa. 1953.
- Bacterial Genetics by *Wernher B. Phillips* D. 238 page. Illustrated. W.B. Saunders Co., Philadelphia, Pa. 1953.
- Fundamentals of Biochemistry in Clinical Medicine by *Nathaniel C. Klineberg* M.D. Assistant Professor of Pathology, Director of the Division of Toxicology, University of Buffalo School of Medicine, Director of the Department of Biochemistry, Buffalo General Hospital, Buffalo, N.Y. 276 page. Illustrated. Charles C. Thomas, Publisher, Springfield, Ill. 1953. Price \$7.75.
- Treatment of Toxic Goiter With Radioactive Iodine by *Leonard S. Davidson* M.D. Director, Isotope Laboratory, Graduate Hospital, Clinical Assistant Professor of Surgery, College of Medicine, University of Illinois, and *Thomas F. Davidson* M.D. Assistant Director, Radioisotope Laboratory, Illinois Hospital, Certificate of Medical License, Physicist, American Board of Radiology, Instructor in Radiology, Northwestern University Medical School, Professor by *Gordon V. LeRoy* M.D. Assistant Director, Division of Biological Sciences, University of Chicago, American Literature Series, Publication Number 197. A Monograph, American Literature Series, Endocrinology, edited by *William D. Thompson* M.D. Clinical Professor of Medicine, University of Illinois, College of Medicine, Managing Editor, Journal of Clinical Endocrinology and Metabolism, Editor, Journal of the American Geriatrics Society, Chicago, Ill. 116 page. Illustrated. Charles C. Thomas, Publisher, Springfield, Ill. 1953. Price \$3.75.
- A Source-Book of Medical Terminology by *Edmund C. Jenner* D.Sc. Formerly Head, Department of Zoology, Riverside College, Riverdale, Calif. For word by *Irvyn H. Pegg* M.D. Director, Research Division, Clinical Chemistry, Cleveland, Ohio. 145 page. Illustration by *Lloyd M. Smith* and the Author, Charles C. Thomas, Publisher, Springfield, Ill. 1953. Price \$5.50.
- Clinical Disorders of the Heart and Blood by *Samuel Blatt* M.D. Director, Division of Cardiology, Philadelphia General Hospital, Director, Division of Cardiology, University of Pennsylvania, Graduate School of Medicine, University of Pennsylvania, Assistant Professor of Medicine, School of Medicine, University of Pennsylvania, Clinical Professor of Medicine, Weiss Medical College, Philadelphia, Pa. 373 page. 164 illustrations. Lea & Febiger, Philadelphia, Pa. 1953. Price \$8.50.

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Electrical Methods of Blood Pressure Recording by *Frank W. Noble* M. E. E. National Heart Institute National Institutes of Health Public Health Service Federal Security Agency Bethesda Md American Lecture Series Publication Number 155 A Monograph in American Lectures in Medical Physics edited by *Otto Glasser* Ph. D. Department of Biophysics Cleveland Clinic Foundation Cleveland Ohio 56 pages illustrated Charles C. Thomas Publisher Springfield Ill 1953 Price \$3

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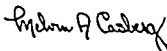
MONTHLY MESSAGE

It is with sincere regret that I terminate my position with the Department of Defense for I have a deep respect for the men and women of the armed services who wear our nation's uniform. It has been a rare privilege to work with them.

The members of my staff have been untiring in their efforts and I wish to express my deep appreciation to them for their loyal support and invaluable assistance. I also owe a debt of gratitude to the Surgeons General and their staffs. At all times I was able to rely on their complete understanding and cooperation. It has been my privilege to have as my advisory council six outstanding leaders in civilian health and medical fields. They have given generously of their time and were always available to discuss and advise on the complex problems with which I was confronted. Whatever success I may have had during the past two years is due primarily to the combined efforts of my staff, the Surgeons General, and the advisory council.

Though I leave Washington with real regret, I depart with the assurance that continued progress will be made in the health and medical fields under the most capable guidance of Dr. Frank Brown Berry, a sincere and loyal supporter of the military services. Dr. Berry has had extensive experience in both civilian and military medicine, having served in World Wars I and II and subsequently as a consultant to the Surgeon General of the Army. Dr. Berry has held a Reserve commission in the Medical Corps of the Army and was retired recently as a Brigadier General. He has numerous important affiliations in civilian medicine and has resigned as Professor of Clinical Surgery at Columbia University to accept the position as Assistant Secretary of Defense (Health and Medical). During the past two months every effort has been made to brief Dr. Berry thoroughly on the various projects which are currently under study and I am confident that he will assume the office with a broad knowledge of the problems facing the medical services of the three military departments.

Both to Dr. Berry and to the personnel of the armed services I extend my very best wishes for continued success in the fulfillment of the medical mission.



MELVIN A. CASBERG, M. D.
Assistant Secretary of Defense
(Health and Medical)

POISONOUS FISHES AND ICHTHYOSARCOTOXISM

Their Relationship to the Armed Forces

BRUCE W HALSTEAD M D

W M LIVELY Jr M D

THE danger of serious illness or death resulting from fish poisoning is emphasized again by an outbreak that occurred on 21 March 1953 among a number of naval Mid Pacific contract personnel at the Kwajalein Naval Base in the Marshall Islands, following ingestion of a black moray eel. Five of the victims became violently ill and a sixth died, terminating an illness of about five weeks. The clinical details of this incident and a preliminary analysis of the toxins involved are discussed elsewhere.¹ This recent outbreak was similar to that of moray eel poisoning which involved 57 Filipino contract workers on Saipan on 8 May 1949.² The more striking symptoms in these patients consisted of ataxia, paralyzes, numbness of the limbs, aphonia, laryngeal spasm, violent convulsions, and coma. In the Saipan outbreak, two of the victims died despite excellent medical care.

According to reports received from Japanese sources, more than 400 military persons succumbed to fish poisoning in Micronesia during World War II. Because of these intoxications the Japanese Navy requested the Nissan Fisheries Institute of Odawara, Japan, to conduct a survey of the poisonous fishes of Micronesia. The study was accomplished by Dr. Yoshio Hyama of the Tokyo University. The final results were published in the form of both civilian and military handbooks.³ All of the Japanese editions were profusely illustrated in color.

During 1944-1945, the United States Military Government at Saipan established the post of fish commissioner. It was the duty of this office to develop a fisheries program to provide our armed services in the Mariana Islands with fresh fish at the rate of 35 pounds per 100 rations per week. As the result of this

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This investigation was supported by research grant from the Division of Research Grants and Fellowships, the National Institutes of Health, U. S. Public Health Service.

program and the fishing experiences of individual military personnel it was found that numerous species of commercially valuable fishes were toxic. On 21 June 1945 Rear Admiral F F M Whiting issued a directive which listed the following fishes as poisonous: barracuda, brown surgeonfish, puffers, pompano, horse mackerel, butterfly fish, red snapper, sea bass, perch, moonfish, triggerfish, and parrot fish. Moreover, it was required that all fishes taken by private fishing parties be inspected by the fish commissioner. Despite these precautions, intoxications occurred. Vonfraenkel and Krick and Cohen and associates reported outbreaks involving 30 and 51 persons respectively. Numerous other cases were said to have occurred which did not appear in the literature.

During 1943 Dr Wilbert McLeod Chapman of the United States Board of Economic Warfare visited bases throughout the tropical Pacific for the purpose of establishing a fisheries program on a semicommercial scale to provide a fresh fish supplement to the diet of military personnel stationed in these areas. He found that they were continually harassed by the ever present threat of fish poisoning. During December to February in certain regions in New Caledonia all carnivorous fishes were considered to be dangerous to eat and in the Fillice Islands a particular species would be poisonous in one area and harmless in another. The conflicting and frequently erroneous information supplied by natives complicated the problem.

Dr Leonard P Schultz, Curator of Fishes, U S National Museum, stated that he was frequently consulted by various branches of the armed services for data regarding poisonous fishes. It is an incontestable fact that wherever our forces were stationed in the Indo-Pacific epidemics of fish poisoning occurred. All too frequently these intoxications were confused with other types of bacterial food poisoning.

Additional information regarding the relationship of poisonous fishes and the military may be found in references 9 through 34. Fish and Cobb prepared an excellent review of the entire subject of noxious marine animals and their relationship to military personnel but unfortunately it has not been published. Handbooks and directives too numerous to list have issued scores of warnings, recommendations, and advice of sundry kinds but despite these admonitions and numerous outbreaks among military personnel the hazards of eating poisonous fishes are frequently underrated.

EPIDEMIOLOGY

Poisonous fishes are widely distributed throughout all warm seas but are particularly numerous around certain island areas.

in the Caribbean, Central, and South Pacific Oceans. It has been estimated that there are about 300 species of poisonous fishes in the Central Pacific. Jensen,³⁶ Boje,³⁸ and Hjortland³⁹ reported some of the arctic sharks to be poisonous. The total poisonous fish population of the world is undoubtedly considerably higher because additional poisonous species are continually being added to the list. In a random series of 93 fish species captured in the Phoenix Islands, 29 percent were found to be toxic.⁴⁰ In a similar series of 60 species captured at the Johnston Island Air Force Base it was demonstrated that 75 percent of the species were toxic.⁴¹ Fish poisoning at Johnston, Line, and Midway Islands is believed to have been part of a general outbreak which apparently started in that area about 1943. Prior to that time poisonous fishes, aside from puffers and other plectognaths, were unknown. Whether this is something new or a cyclic phenomenon remains to be determined. There is no evidence to indicate that any given species of fish, exclusive of puffers, is inherently toxic or toxic all of the time. Apparently a fish becomes poisonous as a result of its food habits. It is believed that the toxic food cycle is initiated by a marine plant of some type. The validity of this theory is now under investigation. Any reef or shore fish is potentially poisonous if captured in an endemic area. Unfortunately, the exact geographic boundaries of these areas are unknown. Moreover, a commercially valuable species in one area may be deadly poisonous in another. The bulk of the research conducted thus far has been devoted to determining the species identification of the disease agents and their geographic distribution.

Reports regarding the seasonal incidence of the disease are conflicting. A few species, such as barracuda and puffer, appear to be more toxic during the reproductive season of the year, but apparently this is not true of most other fishes. Existing records reveal that fish poisoning may occur during any season of the year. Most puffer species are poisonous about 90 percent of the time, and particularly so during their reproductive period. Ingestion of an ounce of the liver or flesh of some puffers has been known to kill a person within 17 to 20 minutes. In general, the visceral organs of a fish, viz., liver, intestines, and roe, are more likely to be toxic than the musculature, and should never be eaten. Because of the paucity of reliable data, epidemiologic studies will of necessity have to continue for some years to come.

A partial list of the fishes most frequently found to be toxic appears in table 1. The list is grossly incomplete and has been provided merely to give the reader some idea of the phylogenetic extent of toxic fishes.

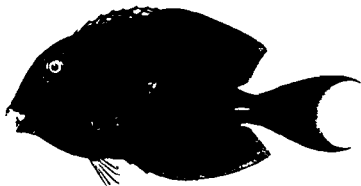
TABLE 1 A p u l e p e t a t v e l t o f f i s h e k n o w n t b e p i s o n o u s

F m i l y n d e t f c m e	C o m m o n n a m e	
	E n g l i s h	H w i n
ACANTHURIDAE <i>Ctenochaetus strigosus</i> (Be t) fig 1	Surgeonfish	M l
DALISTIDAE <i>Dalutides niger</i> (Boa te) fig 2	Tigerfish	Il murhum
CARANGIDAE <i>Caranx fuscus</i> (Quoy d Gaimard) fig 3	Pompano	Ul
DIOGONTIDAE <i>Diodon hyatix</i> (L i s) fig 4	Porcupinefish	O p u k la
LABRIDAE <i>Coris gaimardi</i> (Q uoy nd Gaimard) fig 5	Wrasse	H l
LUTJANIDAE <i>Lutjanus argenteus</i> (Quoy d Gaimard) fig 6	Snapper	Uk
MOVACANTHIDAE <i>Mulena crinita</i> (O b e k) fig 7	Filletfish	Oli
MULLIDAE <i>Parupeneus trifasciatus</i> (L a p e d) fig 8	Surmullet goatfish	W k

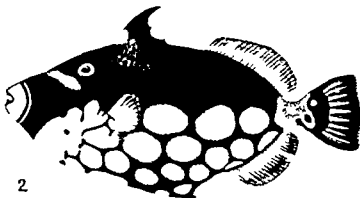
TABLE 1 A partial representative list of fishes known to be poisonous—Continued

Family and scientific name	Common name	
	English	Hawaiian
MURAFNIDAE <i>Gymnallanx javanicus</i> (Bleeker) fig 9	Moray eel	Puhi
SCARIDAE <i>Scorpaenopsis diabolus</i> (Bleeker) fig 10	Parrot fish	Pan hunuhu
STERNAIDAE <i>Cephalopholis argus</i> (Bloch) fig 11	Sea bass gro per	Hapu upu u
SPILYRATRIDAE <i>Sphyrapneustes barbatulus</i> (Bloch and Schn Idler) fig 12	Barracuda	Kaku
TETRAODONTIDAE <i>Arothron hispidus</i> (Linnaeus) fig 13	Puffer	Maki Maki

Because most of these fishes are common throughout the tropical Pacific both English and Hawaiian names are given



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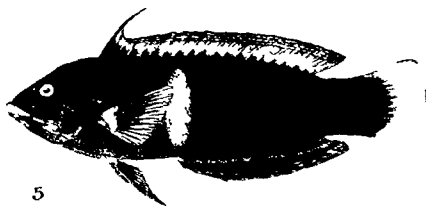


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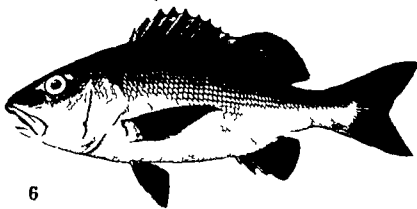


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Figure 1 Surge wrasse (Thalassoma lineare) Figure 2 Triggerfish (Balistidae) Figure 3 Pompano (Caranx fuscus) Figure 4 Porcupinefish (Diodon hyis)



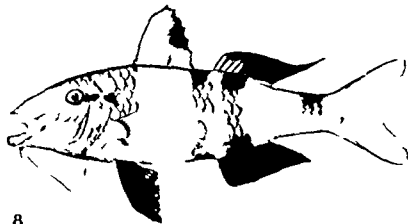
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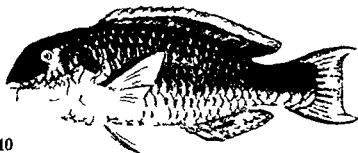


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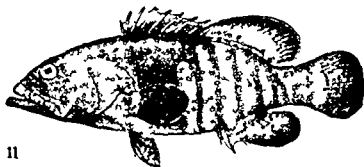
Figure 5. Wrasse (*Coris gaimardi*) Figure 6. Red snapper (*Lutjanus virgatus*) Figure 7. Filefish (*Aluterus scriptus*) Figure 8. Surmullet or goatfish (*Parupeneus str fasciatus*)



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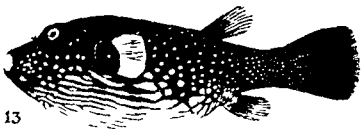
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Figure 9 Moray eel (*Gymnothorax javanicus*) Figure 10 Surge wrasse (*Pomacentrus microrhinus*) Figure 11 Surge wrasse (*Pomacentrus microrhinus*) Figure 12 Barracuda (*Sphyrna barracuda*) Figure 13 Puffer (*Arothron hispidus*)

NATURE OF ICHTHYOSARCOTOXINS

The chemical and pharmacologic properties of most ichthyosarcotoxins, fish poisons, are unknown. Tetraodontoxin or puffer poison has been studied to some extent by the Japanese. Puffer poison, in its purified state, is a white hygroscopic powder, readily soluble in water and insoluble in the ordinary organic solvents. Tetraodontoxin has been assigned the provisional chemical formula of $C_{14}H_{11}NO_{14}$. Japanese scientists are of the opinion that tetraodontoxin is neither a protein, an alkaloid, nor a protamine. The exact chemical structure and source of the poison are still unknown. Moreover, it is not known whether the ichthyosarcotoxins that are found in such fishes as the snapper, grouper, and moray eel are related to puffer poison, or whether they are a different compound. Most fish poisons (exclusive of puffer poison) appear to have a composite physiologic action on humans. Many of the symptoms are similar in nature to those produced by such compounds as aconitine, muscarine, and curare. Whether or not ordinary fish toxins are true alkaloids remains to be seen. These fish toxins are water soluble and relatively heat stable. Ordinary cooking procedures do not destroy or appreciably alter the virulence of the poison. The state of freshness of the fish has no bearing on the production nor the virulence of the toxin because putrefaction is not a contributing factor in this disease.

CLINICAL CHARACTERISTICS

Clinically, fish poisoning can be divided into four types. The relationship of these types to each other is not clearly understood and the terminology by which they are designated is subject to change.

1 *Tetraodon (puffer) poisoning* The causative agent is a puffer, one of the members of the suborder Tetraodontoidea. Numbness of the lips, tongue, and tips of fingers and toes usually develops within 30 minutes after the ingestion of the toxin. These symptoms may be followed by nausea, vomiting, headache, dizziness, and generalized weakness, to the extent that the patient can no longer stand erect but must lie down. Power of speech becomes impaired and dyspnea is marked. Within two hours as a rule, the patient suffers complete paralysis with muscles relaxed and body limp, and is unable to speak although he is conscious. Just prior to death the patient lapses into unconsciousness. Death generally occurs in severe cases within 1 to 24 hours as a result of respiratory paralysis. This is by far the most violent and serious type of ichthyosarcotoxism known. The mortality rate is estimated to be about 60 percent. If the patient survives 24 hours, the prognosis is considered to be good.

2 *Gymnothorax (moray eel) poisoning* The causative agent is one of the members of the genus *Gymnothorax*. Seven species are definitely known to be toxic: they are *G. buroensis* (Bleeker), *G. flavimarginatus* (Ruppell), *G. javanicus* (Bleeker), *G. meleagris* (Shaw and Nodder), *G. petelli* (Bleeker), *G. pictus* (Ahl), and *G. undulatus* (Lacepède). Symptoms of tingling and numbness about the lips, tongue, hands, and feet usually develop within 20 minutes to 7 or 8 hours after ingestion of the toxin. These symptoms may be followed by nausea, vomiting, laryngeal spasm, aphonia, excessive mucus production, foaming at the mouth, conjunctivitis, paralysis of the respiratory muscles, motor in-co-ordination, violent clonic and tonic convulsions, abnormal deep and superficial reflexes, and coma. The mortality rate is estimated to be about 10 percent. The excessive mucus production, laryngeal spasm, violent convulsions, and respiratory distress present difficult problems in the handling of these patients. The acute symptoms generally subside within 10 days in the milder forms.

3 *Ciguatera* This term was originally used to designate fish poisoning exclusive of puffer poisoning resulting from the ingestion of fishes in the Caribbean area. However, recent study of the clinical characteristics of the Caribbean and Pacific types of fish poisoning fails to demonstrate any significant differences between them. Since the term *ciguatera* is well established in the literature, it is recommended that this term be used to designate the milder form of ichthyosarcotoxism without reference to geographic location. Numerous species of fishes are capable of producing this type of poisoning (table 1).

Tingling followed by numbness usually develops almost immediately or within a period of 30 hours after ingestion of the toxin. Nausea, vomiting, diarrhea, and abdominal pain are present in about 75 percent of the patients. Joint aches, malaise, chills, fever, prostration, headache, profuse sweating, pruritus, metallic taste, generalized motor in-co-ordination, muscular weakness, and myalgia are common. Sensory disturbances are present in most cases; the patient complaining of hot objects being cold and cold objects as hot or like electric shock. Convulsions and severe paralyses are less common. Although the mortality rate has been estimated to be only about 2 to 3 percent, complete recovery from the weakness and myalgia sometimes takes weeks or months.

The symptomatology of *gymnothorax* poisoning apparently differs from *ciguatera* in both degree of severity and the type of symptoms present. *Gymnothorax* poisoning develops more rapidly, is more violent, and convulsions and paralyses are prominent. In a typical case of *ciguatera*, the sensory disturbances, myalgia, and extreme weakness are most pronounced.

4 *Scombroid poisoning* This type of fish poisoning results from eating scombroid or tuna like fish (tuna, bonito skipjack, mackerel) in certain tropical regions. It has recently been reported prevalent during the spring months in the Philippine Sea. The symptoms are histamine like in nature, consisting of severe headache flushing of the face congestion of the soft tissues of the eyes, nausea, vomiting giant urticaria and erythema. Patients usually recover within a period of eight to 12 hours. Scombroid poisoning differs from ciguatera in that its clinical manifestations are histamine-like, whereas ciguatera produces neurotoxic symptoms.

CASE REPORTS

The first four cases, reported by one of us (W. M. L.) are representative of ciguatera. This particular outbreak occurred on 9 September 1944 at Tarawa, Gilbert Islands, from ingestion of red snapper (exact species is unknown but probably *Lutjanus vauigiensis*, *Lutjanus gibbus*, or *Lutjanus bohar*—all are common red snappers having excellent flavor, but frequently toxic). The snapper was captured by an elderly Australian shipmaster who had traveled in and around the islands since 1914 and had been brought to Tarawa by the armed services because of his intimate knowledge of the Central Pacific Islands. Moreover, for the preceding 10 months he had been assigned the task of supervising a small fisheries operation for the purpose of supplying the military with fresh fish to eat. The fish was caught at 2100, brought to shore, placed in an electric refrigerator and kept there until it was eaten at 2100 the following night. The meal consisted of fish seasoned with salt and pepper, bread, butter, and coffee with sugar and cream. No other foods were eaten. A number of men in the mess hall ate the bread and butter and drank coffee with cream and sugar, but only the four persons (a U. S. Air Force officer, the Australian shipmaster, and two cooks) who ate the fish became sick. All four ate from the same fish, but ingested varying amounts of it. The more fish each person had eaten, the more acute was his illness.

Case 1 A 29-year old mess sergeant at about 2100 on the night of 9 September ate a 2 by 1 by 1 1/2 inch piece of the forementioned red snapper. About one hour later he developed weakness, profuse sweating, malaise, chill sensations, and a griping abdominal pain. There was no nausea or vomiting, oral paresthesia or pruritus. The feeling of weakness and tiredness became progressively worse until he found it very difficult to walk to the latrine. The patient complained of a very pronounced, heavy, tired feeling in his legs. Because of an extreme feeling of exhaustion he was unable to sleep that night. The next day he noticed that whenever he picked up anything cold, he received a

sensation similar to electricity going through his hand which after a few seconds became very painful This temperature disturbance lasted for four days The patient noticed when he got up and walked about the next day that the peculiar, weak tired feeling came back into his legs and persisted for some time after he ceased motion. He stated that he had never previously felt so weak tired, and miserable The patient was acutely ill for about seven days and continued to feel weak for several days thereafter No laboratory work was performed and no specific treatment was given.

Case 2 A 25 year-old white mess sergeant ate a 4 by 4 by $\frac{1}{4}$ -inch portion of the same red snapper About one hour later he complained of a peculiar sensation of heaviness in his throat and had difficulty in drinking water He later felt dizzy broke out in a cold sweat and complained of being chilly Within a short time he developed a severe griping abdominal pain and had to go to the latrine where he remained for the following two hours having a profuse watery diarrhea The frequent bowel movements resulted in the patient's rectum becoming raw and painful There was no nausea or vomiting During the diarrheal bout the patient began to develop a peculiar dull type of pain in his arms and legs which was aggravated by walking but persisted during rest The patient stated that he was unable to find comfort no matter what position he took Extreme exhaustion weakness and generalized malaise were the chief complaints at this time The following morning when he walked he developed the same dull, aching pain in his legs and again it persisted for about 20 minutes after motion had ceased. These leg pains continued for about four days and then gradually subsided About this time he noticed that whenever he came in contact with a cold object he received a sensation of pins and needles sticking him a cold shower became a very painful experience Ice cold objects felt like an electric shock and after a few seconds he was unable to hold the object in his hand The temperature disturbance continued to be severe for about six days and was present in a mild form for another four days The patient was acutely ill for seven days and felt very weak for 14 days Temperature pulse and respiration were not affected Aside from a single injection of morphine to relieve the myalgia on the evening of the first day no other treatment was administered No laboratory work was done

Case 3 A 56 year-old Australian shipmaster ate three small pieces of the forementioned red snapper About one hour later he noticed a prickly sensation in his mouth when he drank ice water Ordinary tap water tasted flat and peculiar but did not elicit the paresthesia Within a half hour after eating the fish

he developed a diarrhea, having a bowel movement every few minutes for a period of three hours, which left the patient weak and exhausted. There was no nausea or vomiting. The patient developed a generalized malaise and myalgia which made it difficult for him to sit or lie in a comfortable position. Weakness and exhaustion were extreme. About two hours after eating the fish the patient developed the same type of temperature disturbance as in the first two cases. This disturbance lasted for about 14 days. A cool breeze at night would cause a tingling and prickly sensation about his mouth, lips, and body. The patient felt chilly for a period of about two weeks. About four to six hours after eating the fish, the patient developed an intense itching all over his body. When he was awake he was able to refrain from scratching, but when he was asleep he would scratch until he abraded the skin. The pruritus would subside for awhile but anything that would cause him to sweat would start it again. The itching continued to be severe for about 21 days and then gradually disappeared. For about three days the patient had the continual urge to urinate but whenever he went to the latrine, he was able to void only a few drops. The patient hiccuped almost constantly for four days, a process which greatly exhausted him. He remained on quarters for about 14 days but it was 21 days before he had sufficient strength to do even light tasks. During this time he lost about 10 pounds of weight. The patient had difficulty in sleeping for a period of about one month. Temperature, pulse and respiration did not appear to be affected. Laboratory work consisted of a single urinalysis which demonstrated a one plus sugar but this was not considered to be significant. The patient was given a single parenteral feeding of saline and dextrose on the second day. No other data was available regarding treatment.

Case 4 A 36 year-old Air Force officer ate seven pieces of the forementioned red snapper. About an hour later the patient noticed a prickling sensation in his throat and mouth that tended to increase in intensity. About 30 minutes later, the patient developed a griping pain in his abdomen, went to the latrine several times, and finally remained there for a period of four hours because of a violent diarrhea. During this period he had a "heavy sensation" in his arms and legs which was described as feeling similar to the type experienced in walking through deep snow for several hours but many times worse. There was also a feeling of extreme weakness, exhaustion, and myalgia such as was described by the other victims. Resting did not relieve these feelings since there was no position that he could attain which would bring about relief. The chill, sensation and temperature disturbance which has been previously described in the other cases, were also

present Nausea and vomiting were absent An attempt to elicit vomiting was ineffective About four hours after eating the fish an intense pruritus developed which became progressively worse and prevented any satisfactory rest The patient was acutely ill and so obviously miserable that the medical officer gave him an injection of morphine which provided some relief and sleep

The next morning the dull pain that had been present the previous evening returned affecting the stomach arms and legs The pain was described as a continuous heavy, dull sensation that became progressively worse It was observed that with a little movement the pain in his legs increased markedly above the level at which it had previously been when at rest and that it persisted for about 20 minutes after movement had ceased Sixty milligrams of codeine and 0.6 gram of aspirin had no effect on the pain Activity such as holding a magazine up to read would so increase the pain in the arms during the first five days that the patient would have to lay the magazine down The pain was continuously present in the stomach arms, and legs during the first six days except when morphine was administered (which was once a day) The pain would then completely disappear for from eight to 10 hours after the injection On the afternoon of the third day the patient complained of his teeth aching On the second and fifth days the patient tried to eliminate the morphine and took 60 mg of codeine and 2 grams of aspirin but with no relief from pain On the seventh day the patient took six ounces of whisky in an effort to eliminate the morphine and the pain but this only aggravated the myalgia By the fourteenth day the pain had subsided to the extent that 0.6 gram of aspirin and 0.4 gram of pentobarbital would permit sleep During this time the patient was steadily losing weight finally resulting in a loss of 25 pounds At any time up to the twenty second day walking would bring about a recurrence of the pain The temperature disturbance continued for about 28 days and the pruritus continued relentlessly until the thirty fifth day Then gradually these symptoms subsided Extreme weakness myalgia and joint aches of both shoulders persisted throughout the sixth week The patient required a barbiturate each night through the eighth week Temperature pulse and respiration did not appear affected Subsequent contact with the patient revealed that it was necessary for him to keep physical exertion to a minimum for many months

Because this outbreak took place at Tarawa when field conditions were very primitive and medical facilities were at a premium the medical work up was incomplete

OTHER OUTBREAKS

Report 1 Captain John T. Martin,⁴² USAF (MC), formerly Base Surgeon, 1505 Air Base Group, Johnston Island, reported a non-commissioned officer and his family who were poisoned as a result of ingesting a black skipjack, which according to the description given, was probably *Euthynnus yaito* (kishinouye). The fish was captured in the vicinity of the northern peripheral reef at Johnston Island during the latter part of August 1950.

The fish was taken home, cleaned, and cooked within a short time after capture, so there was no opportunity for spoilage. Neighbors stated that they had captured this same species of black skipjack on previous occasions and had eaten it without ill effect. Members of the family eating the fish consisted of the husband, his wife, and two children. A few hours after the meal, all of the members of the family developed nausea and vomiting, tingling and numbness of the lips, mouth, and extremities, clammy skin, mild diarrhea, intestinal cramps, weakness, myalgia, palpitation, and mild to moderately severe prostration. The acute phase of the episode lasted about 36 hours and then gradually the symptoms subsided. The convalescent period was slow, lasting for several weeks, during which time weakness and myalgia of the legs were the predominant symptoms present. Treatment consisted of bed rest and symptomatic relief during the acute stage. Nicotinic acid was used with the hope of relieving the peripheral neuritis, but it proved to be ineffective. Within a period of two months the family had completely recovered. The family cat also ate a liberal portion of the fish and became very ill, afflicted with vomiting and diarrhea but appeared to have recovered within a period of 24 hours.

During the period from May 1950 to May 1951 there were said to be about 20 cases of ichthyosarcotoxism at Johnston Air Force Base.

Report 2 Mr. Allen I. Lewis⁴³ of Contoocook, N. H., reported an outbreak of fish poisoning which occurred at Palmyra, Line Islands, in August 1944, while he was stationed on the island with the U. S. Navy. The causative fish was a red snapper (probably *L. vaigiensis*, *L. gibbus*, or *L. bohar*) which had been captured off the southwest tip of the island near Sand Islet, in the vicinity of the boat channel. About 50 fish were served at mess that evening, but only the fish served at one table proved to be poisonous. In this instance all six of the persons became sick.

About four hours after eating the fish, the symptoms, consisting of tautness and tingling of the skin, dryness of the mouth, dizziness and diarrhea, began to develop. There was no nausea or vomiting. The following morning one of the victims drank some ice

water and noticed that it tasted odd, seemed to stick in his throat," and felt warm instead of cold. One of the group recovered within a period of about 24 hours but the remainder were acutely ill for several days and then gradually recovered. No information was available regarding treatment.

Report 3 The following data was obtained from the files of Miss Margaret Titcomb Librarian of the Bernice P. Bishop Museum regarding three separate outbreaks of fish poisoning which occurred at the U S Naval Air Station at Palmyra Island. The original report from which the accounts are quoted was prepared by Lieutenant junior grade, W J McCann, Jr, MC, USNR, on 12 December 1946. The causative fish in each of these cases was red snapper exact species undetermined.

On 13 November 1946 five men reported to morning sick call stating that they had been poisoned by eating fish the previous night. Their history is as follows. Fish were caught outside of the reef killed cleaned and eaten promptly. Within a few minutes of eating the fish they noticed a peculiar burning sensation in their throats. This was followed in about three hours by nausea vomiting and abdominal cramps. Vomiting gradually diminished and diarrhea began lasting approximately five hours. About this time eight hours after ingesting the fish, they noticed a numbness or tingling sensation which some described as burning of hands and feet associated with moderate motor paralysis of these areas. In addition one man complained of stiffness of the face and tight skin over the face. All complained of vague migratory arthralgia and myalgia along with headache and generalized malaise. One man experienced an attack of syncope related to respiratory embarrassment with evidence of rapid labored shallow respiration. All five men stated that cold water, either in the form of showers or drink caused electric shock like feelings to go through their bodies. These men were not seen by a medical officer until the morning when the course of the disease was about nine hours old. It was too late for emetics but each man was given a cathartic put to bed, and given a fluid diet and sedatives. On the second day two of the men were restored to duty with light assignments and no recurrence of symptoms. On the third day the remaining men were restored to duty, but of this group, one man the one who complained of facial stiffness, still complained of peripheral weakness and was given 50 mg of thiamine hydrochloride orally per day. By the end of the week all five men were fully recovered.

On 6 January 1945 a man was evacuated from a merchant ship after having eaten raw red snapper. While the patient was not acutely ill, he had symptoms of gastroenteritis. No evidence of neural involvement was noted.

"On 1 February 1945, 12 members of the crew of a merchant ship were brought ashore suffering from fish poisoning after eating red snapper caught off shore from Palmyra. The men were extremely ill. All patients were given an emetic, sedation, and soda enemas. It was necessary to give five of the men nikethamide (coramine). All survived and were returned to their ship in a few days."

TREATMENT

An attack of fish poisoning does not impart immunity and there is no known specific antidote. The treatment is purely symptomatic. Gastric lavage and catharsis should be instituted at the earliest possible time. In many instances 10 percent calcium gluconate given intravenously has given prompt relief while in others it has been ineffective. Victims suffering from moray eel poisoning appear to be particularly susceptible to violent convulsions and may present difficult nursing problems. Because the convulsions are precipitated by noise, rest, quiet, and sedation are essential. Paraldehyde and ether inhalation have been reported to be effective in controlling the convulsions. Nikethamide or one of the other respiratory stimulants is advisable in cases of respiratory depression. In patients where excessive production of mucus is a factor, aspiration and constant turning are essential. Atropine has been found to make the mucus more viscid and difficult to aspirate, and is not recommended. If laryngeal spasm is present, intubation and tracheotomy may be necessary. Oxygen by inhalation and intravenous administration of fluids supplemented with vitamins given parenterally are usually beneficial. If the pain is severe, opiates will probably be required. Morphine given in small divided doses has been recommended. Cool showers have been found to be effective in relieving the severe itching. Fluids given to patients suffering from the paradoxical sensory disturbance (temperature upset) should be slightly warm or at room temperature. Vitamin B complex supplements are advisable.

IDENTIFICATION OF POISONOUS FISHES

Native peoples have numerous methods by which they attempt to distinguish a poisonous fish from an edible one. The significance of silver coins, color of the fish, condition of the gills, and position of the scales, *ad infinitum*, is generally based on local superstition rather than on scientific fact. One cannot detect a poisonous fish by its appearance. Moreover, there is no known simple chemical test to determine the edibility of a fish. The most reliable methods involve the preparation of tissue extracts which are injected intraperitoneally into mice, or feeding samples of the viscera and flesh to cats or dogs. Viscera (liver,

intestines and roe) should never under any circumstances be eaten

SUMMARY

Poisonous fishes which are endemic to all warm seas constitute a serious hazard to military personnel. Numerous outbreaks of intoxication and deaths involving military persons have been reported. Ichthyosarcotoxism is comprised of four clinically distinct types: tetraodon, gymnothorax, scombroid, and ciguatera. They appear to vary in severity, types of symptoms, and species of fish. The disease can be defined as a type of intoxication resulting from the ingestion of a neurotoxin which is present in the bodies of certain fishes, and variously manifested by symptoms of extreme weakness, malaise, pruritus, myalgia, paresthesias of the mouth and extremities, paralysis, and convulsions, generally associated with such gastrointestinal symptoms as nausea, vomiting, diarrhea, and abdominal pain. Death when it occurs is from respiratory paralysis. The treatment is symptomatic. A poisonous fish cannot be recognized by its appearance. The public health and military significance of this disease is grossly underestimated and is worthy of much greater attention than it has received.

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THE WITHDRAWAL EFFECTS OF CORTISONE IN THE THERAPY OF RHEUMATIC FEVER IN YOUNG ADULTS

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CORTISONE and pituitary adrenal corticotropin (ACTH) have been used extensively in the treatment of rheumatic fever and rheumatic carditis, but there has been a paucity of literature on the withdrawal effects

When these hormones are discontinued there may be clinical and laboratory evidence of increased rheumatic activity. Article written by Massell and Warren¹ Wilson and Helper² and Massell and associates³ gave brief mention to withdrawal effects of corticoid therapy. Ziegler and Kuttner treated 18 children with cortisone and ACTH. One of their patients showed no withdrawal effect, 14 showed laboratory evidence only and one showed clinical signs of withdrawal. These findings subsided within three weeks after therapy was discontinued. Taran and Gulotta⁴ studied 41 rheumatic children and showed that 61 percent had withdrawal effects. These were observed more commonly after cortisone than after ACTH. The greater the degree of carditis prior to the institution of therapy the more severe were the withdrawal effects. Their conclusions were "This preliminary study points up the observation that the so-called rebound phenomenon is not inconsequential and in some instances must be looked upon with grave concern."

MATERIALS AND METHODS

Twelve patients from 17 to 21 years of age were admitted to this hospital with a diagnosis of acute rheumatic fever fulfilling the diagnostic criteria of Jones.⁵ Treatment consisted of intramuscular injection of a total of 31625 grams of cortisone in 28 days in the following single daily doses: 300 mg for three

days, 150 mg for three days, 100 mg for 15 days, 75 mg for two days, 50 mg for two days, 25 mg for two days, and 12 5 mg for one day

During the treatment period and for two weeks following therapy, patients were on complete bed rest. They received a low salt diet (less than 500 mg per day) and three grams of potassium chloride daily. Patients were observed daily throughout the study. Erythrocyte sedimentation rates (Wintrobe) were done three times a week and uncorrected values were used. Standard 12 lead electrocardiograms were taken three times per week. Temperatures were taken rectally.

An attempt was made to quantify the severity of the withdrawal effects as done by Taran and Gulotta (table 1). The patients were divided into four groups, from one to four plus, according to severity. The manifestations of withdrawal were divided into two groups, those specific for rheumatic fever (carditis and polyarthritits), and those nonspecific, such as elevation of temperature, elevation of sedimentation rate, increase in pulse rate, and electrocardiographic changes. The former were placed in group three and those with evidence of cardiac failure in group four. A single nonspecific manifestation placed the severity in group one whereas, two or more place the withdrawal effect in group two.

CASE REPORTS

Case 1 A 19 year old youth was admitted to this hospital 5 July 1953 with a one-day history of pain in both shoulders, both knees, the right ankle, and in the low lumbar region. On admission, he had objective evidence of polyarthritits, a temperature of 102 F, and electrocardiographic evidence of a nodal rhythm. Three erythrocyte sedimentation rates during the first week of hospitalization were 10, 37, and 36 mm at the end of the first hour, respectively. Cortisone therapy was initiated on 12 July 1953. During the period of therapy a soft, apical, systolic murmur heard on admission increased slightly in intensity. Laboratory and electrocardiographic abnormalities returned to normal. Cortisone was discontinued on 9 August 1953 and no subsequent withdrawal effects were noted (Severity of illness, mild, withdrawal effects, none).

Case 2 A 20-year-old Negro was admitted to this hospital with a history of tenderness and pain in both knees, both thighs, and lumbar back region of two days' duration. Past history revealed previous rheumatic episodes at ages eight and 16 with "murmurs" since the age of eight. Physical examination revealed objective polyarthritits and loud aortic and mitral systolic and

TABLE 1. Symmetry of withdrawal effects

Patient	Time (days)	Duration	Fever	Tachycardia	Elevated diastolic pressure	Abnormal ECG	Joint	Delirious mental murmurs	Severity of withdrawal effect	Severity of illness
1	N								0	Mild
2	3 1 2 5	Peristaltic 6 day 1 day 2 day	+		+	+	+		3	Mild
3	2	3 day	+						1+	Mild
4	-6 3 +2 4	19 day Peristaltic 1 day 3 day				+		+	3	Mild
5	3	1 day	+						1	Mild
6	N								0	Mild
7	1 3	17 day 6 day	+	+					2	Mild

TABLE 1 Summary of withdrawal effects—Continued

Patient	Time of onset (days)	Duration	Fever	Tachycardia	Elevated sedimentation rate	Abnormal ECG	Joints	Development of diastolic murmur	Severity of withdrawal effects	Severity of illness
8	3	9 days	+		+				2+	Moderate
	0	13 days								
9	9	11 days	+		+		+		3+	Marked
	5	3 days								
	0	10 days								
10	+1	3 days			+				1+	Mild
11	3	4 days					+		3+	Moderate
12	+1	Persistent	+					+	3+	Moderate
	+6	6 days								
Total			8	1	4	2	4	2		

B for () or after (+) corticosteroid was discontinued

Case 8 A 21 year-old man was admitted to this hospital with swelling redness tenderness and pain in the right ankle of two-day duration. On admission, his temperature was 104° F a grade 2 apical systolic murmur and a grade 2 basal diastolic murmur were present and erythrocyte sedimentation rates were 17 44 and 23 mm at the end of the first hour. Cortisone treatment was started 26 June 1953 and the polyarthritis disappeared and the temperature and sedimentation rate returned to normal. Murmurs subsided over a three-week period. On 20 July he developed temperature elevation marked malaise and anorexia. Therapy was discontinued 23 July. Temperature remained above normal for nine days reaching a high of 104° F. Sedimentation rate became elevated on 23 July and remained so for 13 days, reaching a high of 49 mm at the end of the first hour (Severity of illness moderate withdrawal effects two plus).

Case 9 This 20-year-old man was readmitted to this hospital 29 July 1953. He had been hospitalized with acute rheumatic fever from November 1952 to April 1953 during which time he had received combined salicylate and cortisone therapy. In June 1953 he developed "painful swollen feet" pain in both knees and marked malaise. Physical examination on readmission revealed a temperature of 100.8° F polyarthritis a grade 3 apical systolic murmur a grade 2 apical diastolic murmur and a soft basal diastolic murmur. The erythrocyte sedimentation rate was 37 mm at the end of the first hour. He had been given cortisone from 2 July to 29 July 1953 and the polyarthritis disappeared and the temperature and laboratory findings returned to normal. Subjective vague myalgias however persisted throughout the course of therapy. On 20 July he developed temperature elevation to 102.2° F. This persisted for 11 days. On 24 July he again developed pain in the left shoulder and low back. This persisted for three days. On 29 July the erythrocyte sedimentation rate was increased and it remained so for 10 days (Severity of illness marked withdrawal effects three plus).

Case 10 This 19-year old man was admitted to this hospital 25 June 1953 complaining of pain and tenderness in both ankles malaise and anorexia of four day duration. Physical examination revealed low grade temperature elevation, a grade 2 apical systolic murmur and a swollen, red tender left ankle. Erythrocyte sedimentation rates during the first week of hospitalization were 41 47 and 42 mm at the end of the first hour. Cortisone was begun on 24 June and the patient showed rapid symptomatic relief. The sedimentation rate returned to normal. Therapy was stopped 26 July. On 27 and 29 July the patient had a mildly elevated erythrocyte sedimentation rate of 22 and 21 mm at the end of the first hour respectively. There was some vague ma-

laise and anorexia for one week, but the patient showed no other withdrawal effects (Severity of illness, mild, withdrawal effects, one plus)

Case 11 A 19 year old youth was admitted to this hospital 4 August 1953 complaining of pain and tenderness of one-week duration in the right hip, both shoulders, and both plantar arches. Physical examination on admission revealed a temperature of 101.8 F polyarthritis, and a grade 1 apical systolic murmur. Erythrocyte sedimentation rate was 35 mm at the end of the first hour. An electrocardiogram revealed a "shifting pacemaker" from the sinoauricular to the auriculoventricular node. Cortisone therapy was begun 5 August, and the patient improved symptomatically and the laboratory tests returned to within normal limits. Cortisone was discontinued 1 September. On 29 August, the patient developed a swollen, red, tender, painful right wrist. This lasted four days. The patient had no other symptoms and laboratory determinations remained within normal limits (Severity of illness moderate, withdrawal effects, three plus)

Case 12 This 20-year old man was admitted 27 July with a history of a swollen, tender, painful left knee and an intermittent "skin rash" of one week duration. Physical examination revealed a temperature of 100.6 F, polyarthritis, a grade 2 apical systolic murmur, a questionable basilar diastolic murmur, and erythema marginatum. The sedimentation rate was 49 mm at the end of the first hour. An electrocardiogram revealed a P R interval of 20 at a rate of 94. Cortisone was begun 30 July and all positive findings except intermittent erythema marginatum subsided. Cortisone was discontinued 26 August. Beginning 27 August an apical mid diastolic murmur was heard. From 2 to 8 September, the patient ran a low grade temperature elevation to 100.4 F. Intermittent erythema marginatum has persisted (Severity of illness moderate withdrawal effects, three plus)

OBSERVATIONS

Withdrawal effects occurred in 10 of 12 cases from nine days before to seven days after therapy was discontinued. There was no characteristic pattern of its onset or of its course. The most frequent manifestation was fever, occurring in eight of the patients showing withdrawal effects. Next in frequency were elevated erythrocyte sedimentation rate in four, polyarthritis in four, abnormal electrocardiographic findings in two, development of diastolic murmurs in two and tachycardia in one. These abnormal findings usually subsided in from one to 19 days, although in three cases elevated sedimentation rate (case 2) and an apical diastolic murmur (cases 4 and 12) persisted.

Withdrawal effects may be classified as follows Five patients in the three plus group two in the two plus group, three in the one plus group and two in the group without withdrawal effects Generally speaking although the number of cases was altogether too small it would seem that the withdrawal effects were more pronounced in the cases with severe carditis at the onset of their illness (table 1) Withdrawal effects were also greater in those individuals who had had previous attacks of rheumatic fever (cases 2 and 9)

DISCUSSION

It is recognized that some of these findings may represent a release or escape from cortisone suppression rather than true withdrawal effects However this makes them no less important and does not change their possible significance

It is in the patient with severe rheumatic carditis or previous history of rheumatic fever that a severe withdrawal is of the most consequence because it subjects the individual who has the least tolerance to the most strain It is the belief of the authors that altogether too little attention has been paid to this phenomenon and that in the evaluation of therapy one must consider the possible consequences of the withdrawal period It is also believed that methods of lessening the severity of symptoms or shortening the withdrawal period are important future considerations

Seven additional patients have been treated with large doses of salicylates 9.3 grams for three days 8.3 grams for three days 6 grams for 15 days 5 grams for two days, 3.3 grams for two days 1.6 grams for two days and 0.6 gram for one day Total 28 days 163.2 grams The withdrawal effects in these patients were essentially no different from those in the patients receiving cortisone Four patients may be placed in the three plus group one in the one plus group and two were without withdrawal effects

SUMMARY

In twelve patients with acute rheumatic fever who were treated with cortisone varying degrees of withdrawal effects were observed Patients with severe rheumatic carditis and those with previous rheumatic fever presented the most pronounced signs of withdrawal

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Captain Charles F Gell Given John Jeffries Award for 1953

Captain Charles F Gell MC USN Director of the Naval Aviation Medical Acceleration Laboratory Johnsville Pa. received the 1953 John Jeffries Award on 25 January at the "Honors Night" dinner of the Institute of the Aeronautical Sciences at the Astor Hotel in New York during its twenty-second annual meeting. The award which consists of an appropriate plaque and an honorarium is given each year "for outstanding contributions to the advancements of aeronautics through medical research."

A native of Chicago, Captain Gell graduated from Loyola University School of Medicine in 1936 and was commissioned a lieutenant (jg) in the Medical Corps U S Navy in 1938. He was graduated from the School of Aviation Medicine, Randolph Air Force Base, Texas in 1938 with the rating of flight surgeon and was designated a naval aviator in 1945 following the completion of a course in flight training at the Naval Air Station, Pensacola, Fla. He has been engaged for several years in research on the effects of acceleration on aircraft pilots and has published many articles in this special field of aviation medicine.

The John Jeffries Award was established in 1940 by the Institute of the Aeronautical Sciences in honor of the memory of Dr. John Jeffries, an American physician who, with Pierre Blanchard, the French balloonist, made the first aerial crossing of the English Channel in 1785 and on a previous voyage made the earliest recorded scientific observations from the air. The 13 previous recipients of this award include seven regular Medical Corps officers of the Navy and Air Force.

HYPERTHYROIDISM TREATED WITH IODINE-131

ELMER R KING *Command MC USN*
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IT is generally acknowledged that the over all results of radioisotope therapy have been disappointing but the results obtained by the use of iodine-131 in treating hyperthyroidism appear to have compensated for the time and expense invested in less successful therapeutic attempts with radioisotopes. This use of radioiodine was first reported by Hamilton and Lawrence and Hertz and Roberts in 1942. In the past decade thousands of patients suffering from hyperthyroidism have been successfully treated with iodine-131. Recently McCullagh reported over 600 such cases with results which he terms "consistently excellent."

The purpose of this article is not to report a new method or different results but to add 40 consecutive unselected patients with hyperthyroidism and cardiac disease to the total group treated with radioiodine during the first decade of its use.

PATIENT SELECTION

All patients presented have had follow ups ranging from six months to three years. It was coincidental that 20 men and 20 women constituted the series.

Surgery was recommended for all patients in the child producing age but a few young patients were so toxic they could not be prepared for surgery and were treated with radioiodine. The younger age group was treated by surgery not because our group believed that the dose of iodine-131 required to treat them would endanger their reproductive capacities nor because of any accepted danger of hereditary complications but because we wished to avoid controversies with our colleagues.

From U. S. N. 1 Hospital Bethesda Md. Command. King, now aboard the U. S. S. Valley Forge.

Patients with toxic adenomas were not treated with radioiodine, but were referred for surgical treatment. Experience has shown that it is very difficult to treat such patients adequately with iodine-131, and if so treated, the condition recurs in a large number. Once a toxic adenoma is "burned out" with radioiodine, another one may form from a latent nest of cells to replace the treated nodule. Toxic nodular goiters were not selected because of the high incidence of carcinoma in the adenomas.

In general, patients selected for iodine-131 therapy were over 35 years of age and displayed clinical hyperthyroidism, with or without exophthalmos, substantiated by BMR tests and iodine-131 uptake studies. Many of the patients had been operated on previously. A few were senile cardiac patients who did not present marked hyperthyroidism. There were also a number with auricular fibrillation in a mild to severe hyperthyroid state.

METHODOLOGY AND DOSAGE

Prior to treatment all patients were studied by means of iodine-131 thyroid uptake studies. A dose of 50 microcuries was administered orally, and counts were made with a calibrated collimated Geiger tube 12 inches from the isthmus of the thyroid gland after 24 and 48 hours. No urinary excretion studies were performed. The patient was removed from all iodine-containing drugs or compounds, including the radiopaque materials and all antithyroid compounds, for at least three weeks prior to the tracer study.

In order to predetermine the dose of radiation delivered to the thyroid tissue, it is necessary to estimate the weight of the thyroid gland. Even then an accurate determination is not possible because the isotope has been shown by autoradiographs to have an uneven distribution throughout the tissue. Consequently, some areas will receive a much higher radiation dose than others. In the majority of patients we have found it impossible to estimate the dose of iodine-131 on the basis of the weight of the thyroid gland. Because of this we have adopted an empirical dose of about 5 millicuries of iodine-131 with which we treat the majority of our patients. This was done with the understanding that a number of these patients would require an additional dose after a period of evaluation ranging from three to six months.

The accepted tissue dose to the thyroid gland required for a regression of the symptoms of hyperthyroidism is of the order of 15,000 to 30,000 roentgen equivalent physical. This tissue dose can be achieved by a retained dose of 100 to 200 microcuries of iodine 131 uniformly distributed through each gram of thyroid tissue present.

The therapeutic dose of iodine 131 was administered orally. Until recently hospitalization for from three to seven days was required of all patients treated. No hospitalization is required at the present time. During the first 96 hours after treatment all urine was collected and daily radio-assays were performed in order to estimate the iodine-131 retention. No special diets, orders, or precautions were necessary following treatment in this group of patients.

CASE REPORTS

Case 9 This 42 year-old white woman developed hyperthyroidism early in 1950 and in October after preparation with propylthiouracil and Lugol's solution, a subtotal thyroidectomy was performed. Following this she continued to have symptoms of Graves' disease, and was given Lugol's solution roentgen-ray therapy and propylthiouracil at various times without control of symptoms. A toxic manifestation to propylthiouracil eventually developed, and the patient was referred to this hospital for the first time on 23 January 1952. Physical examination on entry revealed tachycardia, exophthalmos, and a diffusely enlarged thyroid gland. An iodine 131 tracer study on 28 January showed 63 percent concentration in the gland at 48 hours. On 4 February the initial therapeutic dose of 5.2 millicuries of iodine-131 was administered.

In June the patient returned for evaluation and stated that about six weeks after treatment she had noted a definite decrease in nervousness and tremor. A second tracer study on 5 June showed 49 percent concentration at 48 hours. A second therapeutic dose of 5.0 millicuries of iodine-131 was given on 13 June. On 13 October a third tracer study revealed 26 percent concentration at 48 hours. The patient was asymptomatic and has remained so to date.

Case 10 This 36 year-old woman was admitted to this hospital on 16 January 1951 complaining of extreme nervousness, intolerance to heat, large appetite, and easy fatigability of seven months duration. In 1944 the diagnosis of Graves' disease had been first established and a subtotal thyroidectomy had been performed with complete amelioration of all symptoms until seven months prior to entry. Physical examination revealed an extremely thin, apprehensive white woman with tachycardia, fine tremors of the hands, mild exophthalmos, and a diffusely enlarged thyroid gland. On 7 February 1951 an iodine-131 tracer study showed 70 percent concentration in the thyroid gland at 48 hours. The initial therapeutic dose of 5.6 millicuries of iodine-131 was given on 19 February.

She was discharged to home but returned to the hospital for evaluation on 21 May. At that time she stated that she felt per-

fectly well There was absence of tremor, tachycardia, and exophthalmos, and the thyroid gland had returned to normal size A second tracer study showed 30 percent concentration at 48 hours

A study on 13 December showed 25 percent concentration at 48 hours At that time the patient felt perfectly well and has remained asymptomatic to date

Case 12 This 48 year old woman was first seen at this hospital on 19 November 1951 She had hyperthyroidism of nine years' duration Five years previously a subtotal thyroidectomy had given only partial relief from symptoms of Graves disease On admission she complained of weakness, nervousness, tremors, vomiting, and bouts of diarrhea Physical examination revealed a hyperactive, anxious woman with a markedly enlarged thyroid gland There was a bruit over the gland on auscultation. An iodine 131 tracer study showed 73 percent concentration at 48 hours On 12 March 1952 the initial therapeutic dose of 8.0 millicuries of iodine-131 was given

She returned for re-evaluation on 9 June and stated that during the previous 30 days she had felt perfectly well and had gained 20 pounds All emotional instability and tremor had disappeared A repeat iodine 131 tracer study on 14 June showed 29 percent concentration at 48 hours The patient felt perfectly well

Case 19 This 51 year old man was first seen at this hospital on 15 October 1951 complaining of dyspnea on exertion, orthopnea, ankle edema of one month's duration, intolerance to heat, excessive appetite without weight gain, nervousness, and palpitation of the heart of four years' duration Physical examination on admission revealed a chronically ill white male with auricular fibrillation, pulmonary edema, hepatomegaly, and ankle edema There was no evidence of hypertension or valvular heart disease On entry he was given digitalis, diuretics, a low sodium diet, and rest in bed There was prompt diuresis with a weight loss of 20 pounds All evidence of fluid retention cleared but the auricular fibrillation persisted.

On 5 November an iodine-131 tracer study was performed with 53 percent concentration in the thyroid gland in 48 hours The initial therapeutic dose of 8.0 millicuries of iodine-131 was given on 9 November On 13 November the auricular fibrillation was converted to sinus rhythm with quinidine sulfate

During the following five months the patient remained entirely asymptomatic while on full activity In that time he gained solid weight from an initial 171 pounds to 191 pounds There was no recurrence of cardiac arrhythmia

On 10 April 1952 an iodine 131 tracer study showed 19 percent concentration in the thyroid gland. The patient has remained asymptomatic.

Case 29 This 25-year-old woman was referred to this hospital on 5 February 1952 with hyperthyroidism of 18 months' duration. Treatment with propylthiouracil prior to admission was discontinued due to a sensitivity dermatitis and agranulocytosis. Physical examination on entry revealed a thin apprehensive white female with a diffusely enlarged thyroid gland, tremor of the hands, and tachycardia to 145 per minute. Serial BMR studies averaged plus 35 percent. All attempts to control the condition were unsuccessful and subtotal thyroidectomy was deemed inadvisable. The patient's symptoms progressed rapidly and dictated the therapeutic use of iodine-131 as an emergency measure.

On 3 March the initial therapeutic dose, 7.0 millicuries of iodine 131, was administered. Within one month there was prompt regression of symptoms with return of heart rate to normal. A follow up iodine-131 tracer study on 10 July showed 65 percent concentration in the thyroid gland in 48 hours. A second therapeutic dose of 5.0 millicuries of iodine-131 was then given on 15 July. The patient was seen again on 22 October at which time an iodine-131 tracer study was 24 percent concentration at 48 hours. There were absolutely no symptoms of Graves' disease and the patient had gained 15 pounds in weight.

Case 30 This 51 year old man was first seen at this hospital on 27 November 1950. On entry he complained of easy fatigability, intolerance to heat, increased nervousness of one year's duration, and a fine tremor of the hands of eight years' duration. During the year prior to admission he had lost 20 pounds in spite of an excessive appetite. In June auricular fibrillation began and persisted on admission. Physical examination revealed a totally irregular radial pulse of 112 per minute and a coarse tremor of the hands which made legible writing impossible. There was no evidence of hypertension or valvular heart disease.

On 4 December an iodine-131 tracer study showed 58 percent concentration in the thyroid gland at 48 hours. On 18 December 1950 the patient was given the initial therapeutic dose of iodine-131 of 10 millicuries. Approximately three weeks later he stated that he was losing the intolerance to heat and was becoming less nervous. With quinidine sulfate the auricular fibrillation was converted to sinus rhythm on 19 January. During the next three months the patient gained 16 pounds. All symptoms of Graves' disease cleared and he maintained a normal cardiac rhythm.

In November 1952, he returned for evaluation. During the intervening 20 months he had remained on full duty without any difficulty. An iodine-131 tracer study on 10 November revealed 18 percent concentration at 48 hours.

RESULTS

An equal number of men and women were treated (tables 1 and 2), but this was coincidental.

TABLE 1

Patient	Sex	Age	Pretherapy tracer (percent)	Number of therapeutic doses necessary	Total dose (mc)	Most recent post-therapy tracer (percent)
1	F	36	46	1	5	
2	M	34	79	2	10.7	4
3	M	42	57	2	12.6	18
4	F	68	76	2	10.4	20
5	M	58	40	1	10.0	20
6	M	35	50	1	10.1	18
7	M	68	37	3	29.0	
8	M	46	57	1	5.0	50
9	F	42	63	2	10.2	26
10	F	37	70	1	5.6	25
11	F	64	63	2	10.0	38
12	F	47	73	1	8.0	29
13	M	42	40	2	10.0	55
14	F	60	56	4	23.3	33
15	F	64	43	1	5.0	11
16	M	30	50	1	5.0	12
17	F	44	62	2	15.5	
18	F	42	75	1	5.5	5
19	M	51	53	1	8.0	19
20	F	53	60	1	10.2	12
21	M	55	57	1	5	10
22	F	53	74	1	10	46
23	F	38	70	1	6	0
24	F	44	53	1	7.3	5
25	M	53	75	2	9.9	29
26	F	57	65	1	10.0	24
27	F	31	62	1	5.0	9
28	F	62	65	2	15.1	25
29	F	25		2	12.0	24
30	M	51	58	1	10.0	18
31	M	40	75	1	15.1	30
32	M	56	90	3	35.5	6
33	M	63	54	1	5.4	13
34	F	55	70	1	6.0	13
35	F	69	60	1	10.0	4
36	M	55	71	3	15.0	24
37	M	47	43	1	5.0	10
38	M	51	47	1	5.4	12
39	M	45	58	1	5.1	15
40	M	52	55	1	10.7	0

TABLE 2

	Me	W m	Over all
Number of patients	20	20	40
Mean age in years	48	49	48.5
Median	11.1 m	9.5 mc	10.5 mc
Required multiple doses	35 percent	35 percent	35 percent
Required following surgery	5 percent	35 percent	20 percent
Concomitant heart disease	30 percent	15 percent	22 percent
Percentage of patients clinically cured	25 percent	15 percent	20 percent
Clinically euthyroid	65 percent	85 percent	75 percent
Clinically hypothyroid	10 percent	0	5 percent

Although no selection of patients was made the mean age and the mean total dose were nearly the same in both men and women (table 2). Thirty five percent of each sex required multiple doses of radioiodine in order to produce a clinical remission. The ratio of women to men who were suffering from recurrences following surgical intervention was seven to one. Twenty two percent of the treated patients exhibited heart disease in addition to presenting a hyperthyroid state. Three fourths of the patients treated were clinically cured. Twenty percent of those treated subsequently required thyroid to maintain a normal metabolic state. Three of these patients (seven percent) were frankly myxedematous. Two of the patients (five percent) were not available for follow up studies. In absolute figures these must be added to the myxedematous group, making a maximum of 12 percent of all treated patients who might possibly suffer from myxedema following this form of therapy. It must be stated also that two patients presented evidence of a continued hyperthyroid state following iodine-131 therapy and are to return for further study.

TABLE 3

	M (percent)	W m (percent)	Over all (percent)
Patients having ophthalmopathy	28	14	42
Percentage of patients with remission of exophthalmos	29	23	52
Percentage of ophthalmopathy	12	0	12
Number of patients with exophthalmos	23	12	36

Table 3 shows the number of patients in this series suffering from exophthalmos. Twice as many men as women presented additional complaints of exophthalmos. A total of 52 percent of those with exophthalmos underwent a remission following therapy with iodine-131. It is acknowledged that this condition is not completely understood and that those patients who experienced relief probably exhibited a "levator spasm" of the eyelids rather than true exophthalmos. Twelve percent of the male patients and no female patients demonstrated a progression of their exophthalmos. In one of these patients the condition progressed to a malignant state and required a surgical procedure. In addition, it should be stated that of the 17 patients who presented exophthalmos, 36 percent remained stationary in regard to their eye symptoms. Of this latter group, the ratio of men to women was nearly two to one.

DISCUSSION

One of the most important problems regarding the treatment of hyperthyroid patients has in most instances been overlooked. It is usually recognized that differentiation between patients in a pure anxiety state and those in a hyperthyroid state is often difficult, and in fact these conditions themselves tend to overlap. However, once one or the other diagnosis is "established," the other phase is very often forgotten.

The results of radioiodine treatment of the hyperthyroid state are equal to or better than the results of an operation. In addition the patient may be assured there will be no damage to his recurrent laryngeal nerves or parathyroids if he is treated with radioiodine. Many patients, particularly those with psychic overlays," are aware of these complications that may follow surgery.

In the selection of patients in this series no attempt was made to treat any patient under 40 years of age, although, as may be noted in table 1, four women and two men younger than this age were accepted. Other than this fact, the cases presented were unselected and are the first 40 patients treated by this clinical radioisotope laboratory.

The fact that the sexes are equally divided, that the average age of each sex is the same, and that the average total dose of radioiodine administered each sex is the same appears significant. It is for these reasons that the results are presented as a comparison of male and female patients. A total of eight patients treated with radioiodine for hyperthyroidism had previously been treated by one or more surgical procedures for the same disease. Seven of these patients were women and one was a man. However, multiple doses of radioiodine were necessary in seven

men and seven women (35 percent of the series) before a remission of the symptoms could be obtained. Of the patients requiring multiple doses of iodine-131 only two had previously undergone surgical intervention. This bears out the fact that the return of symptoms after the operation was not due to a toxic nodular goiter which had not been recognized. It has been stated that recurrences are numerous in the latter disease following the use of radioiodine therapy as well as following surgical procedures.

Table 2 also reveals that 75 percent of the patients treated had a good clinical remission. This compares well with the results of other investigators. This figure of 75 percent might be increased because two of the patients who had received one therapeutic dose remain at the time of writing in an improved state although presenting clinical hyperthyroidism which will require an additional dose of iodine-131. Twenty percent of the patients require thyroid to maintain a comfortable metabolic level. Of this group three patients are frankly myxedematous, two of them purposely rendered so because of concomitant heart disease. To the myxedematous group which we have interpreted as presenting unfavorable results are added two patients who could not be followed. Thus the maximum number of unfavorable responses possible are five or 12 percent of the total. This compares favorably with the 10 percent reported by other investigators as developing myxedema following this form of therapy.

Six men and three women suffered from heart diseases in addition to their hyperthyroidism. Seven of these patients presented auricular fibrillation and all such patients responded to the described treatment for their thyroid condition. In all patients in the latter group the hyperthyroid state was discovered as a part of the routine clinical work up. One patient with intractable angina also was discovered to have had an increased thyroid function.

From the results of this study it is suggested that judicious use of radioiodine in treatment of diffuse hyperthyroidism is a practical and safe procedure. The presence of a hyperthyroid state is also to be considered in all cases of auricular fibrillation and in other chronic heart diseases.

SUMMARY

Forty consecutive unselected patients with hyperthyroidism were treated with iodine-131. Follow ups varied from six months to three years. There were an equal number of men and women in the series and both the mean age and the total mean dose required for each sex approached equality. The number of patients

of each sex requiring more than one therapeutic dose for maximum clinical remission also was equal

Seven women and one man were treated following one or more previous surgical procedures. Nine of the patients treated suffered from concomitant heart disease. Three fourths of the patients treated had a good clinical remission. Eight percent became myxedematous and in twelve percent a mild hypothyroid state resulted. Five percent were not followed. Seventeen of the patients presented additional complaints of exophthalmos. Of this number 52 percent had remission of their eye symptoms, six percent noted progression of their exophthalmos, and in 36 percent the eye symptoms remained stationary.

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Duodenal Ulcer Surgery

To make a diagnosis of duodenal ulcer is one thing and to know when to operate is quite another. A simple ulcer with which the patient can live in comfort with reasonable care requires no surgery. A complicated ulcer which continues to incapacitate the patient over a period of years however is not a simple ulcer. To persist in delaying operation in such cases is as unsound in principle as to operate without adequate justification. Herein lies a fruitful field for the combined efforts of the physician and the surgeon. The ultimate result depends largely upon the choice of the operation. At present there is a trend toward resection for acute perforations provided the patient's condition permits. In the majority of cases however the immediate necessity of saving the patient's life calls for nothing more than closure of the perforation. The ultimate result is a secondary consideration even though a large number of those who have a closure alone may be expected to require a subsequent operation.

—R. L. SANDERS, M. D.
in *Journal of the Kansas Medical Society*
p. 505 Nov. 1953.

THE NAVAL PSYCHOLOGIST IN THE FAR EAST COMMAND

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TO understand the role of the clinical psychologist in the Far East Command one must understand the physical and psychologic situation in which he operates. No matter where the psychologist is assigned in this command he becomes a member of a medical team. It is probably best to describe the "big picture" first and locate the psychologist in his usual setting.

A U S Marine Corps psychiatric casualty was first seen by either a psychiatrist or a psychologist after he had been evacuated to the medical battalion by his regimental medical officer. If he responded to rest, sedation, and reassurance he was returned to duty with his unit. At the forward medical company the marine psychiatric casualty saw the psychiatrist or psychologist sometimes both for initial evaluation away from the scene of combat. The forward psychiatric unit established there attempted rapidly to evaluate all of the incoming psychiatric casualties, keeping only those patients who might respond quickly to sedation, warm food, a dry place to sleep, and a diminution of combat noise. Those who did not appear to be promising candidates for the responsibility of active combat were either sent to the rear psychiatric unit or evacuated to the hospital ships for further evaluation and disposition. The forward psychiatric unit attempted to receive the psychiatric casualty as far forward as possible as this minimized the secondary gain of the patient's symptoms. The rear psychiatric unit might be two miles to the rear or beyond the division command post. In the beginning the forward psychiatric unit consisted of the psychiatrist and the rear psychiatric unit was staffed by the psychologist; later, when more professional assistance arrived, the more experienced team made up the forward unit while the rear unit was composed of the less experienced. At times the situation demanded that all of the psychiatrists and psychologists work within the same unit. It was

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ow t U S Naval Acad my A napol Md

at these times that the various medical companies needed to be reassured that the unit would not create a state mental hospital atmosphere

EVALUATION OF CASUALTIES

On board a U S naval hospital ship the psychiatric casualty was evaluated by a psychiatrist, but there was no psychologist available. If the casualty was not returned to the division he was evacuated to the U S Naval Hospital, Yokosuka, Japan. Here again the patient was evaluated by the neuropsychiatric staff, which included a psychologist, and returned to duty, sent to a rehabilitation camp, or evacuated to the United States. The subtle differentiation between evaluation and treatment has not been discussed above because of the difficulty of making what might be an artificial distinction. Any casualty who moved beyond the division area was logged as an evacuee. It is interesting to note in this regard that for the 10 month interval that this psychiatric unit was assigned to the First Marine Division, 56 percent of the patients seen were returned to an effective duty status while the remaining 44 percent were evacuated to the hospital ships and beyond. Such a percentage is not impressive until one considers that less than 10 percent were readmitted. Also, less than 10 percent were evacuated to the continental limits of the United States. That such an evaluation program was carried out with dispatch can be verified when one discovers that 96 percent of the psychiatric casualties were hospitalized within the First Marine Division for less than 15 days. The efforts of the psychiatric unit represented a sizeable gain for the First Marine Division in terms of manpower. Prior to the arrival of either a psychiatrist or psychologist in Korea, the U S Naval Hospital, Yokosuka, had absorbed nearly the entire load of psychiatric casualties.

In April 1951 one of us (A. E. McM.) followed Commander C. S. Mullin, MC, USN, to the First Marine Division while the other was assigned to the neuropsychiatric staff of the U S Naval Hospital, Yokosuka. It was at this point that the above-described chain of evacuation was set up. Later, when additional professional assistance was assigned to Korea from this hospital, the psychiatric unit became more than a skeleton of an organization.

HEAVY FLOW OF PATIENTS

In terms of handling the flow of patients, the psychiatric unit differed little in function from early to late 1951. As one might expect, the ratio of psychiatric casualties to those wounded in action varied from 1:10 to 1:4. The latter was the more usual rate. For two professional people to screen the sometimes heavy

flow of patients, as was done earlier in 1951, it seemed advisable for one to remain with the most forward medical company and one to be attached to a more rearward medical company with less crowded facilities. Translated into action, this meant that the psychiatrist functioned both as an evaluator and as an instructor in that he initially screened the psychiatric casualties at the forward medical company as well as briefed the various battalion and regimental medical officers as to how such casualties could be handled best. The psychologist at this time was with the next rearward medical company where he followed up the psychiatrist's initial impressions. A full history was obtained at this time. Also every effort was made to get the individual participating again as a member of a group through athletics group games, and individual interview. This was made more difficult by having to either improvise the necessary equipment or to procure it through other sources.

In terms of equipment the psychologist had a unique problem. He had only the few supplies he had brought with him and he had no place to store them. It soon became apparent that they would have to be carried by him as a part of his personal gear in moving to various medical companies, especially during the rapid advances and withdrawals of 1951.

SERVICES OF PSYCHOLOGIST REQUIRED

The services of a psychologist were required for psychodiagnostic studies on many occasions. These referrals were initiated for a number of reasons and always through one of the psychiatrists or on a consulting basis with one of the medical company doctors. Of the total number of patients seen by the psychiatric unit, 41 percent were evaluated by psychologists. Of these, about one third were given a complete personality test evaluation. Just as the psychiatrists were at times called on to assist in medical duties unrelated to psychiatry, the psychologists were asked to perform some administrative duties which were unrelated to psychology. By and large however, the limitations placed on the psychologists were self imposed.

RESEARCH UNDER FIELD CONDITIONS

The field situation for research purposes has many advantages but even more disadvantages. The broad considerations of the research design and the theoretical problems were easily drawn up. The more specific demands of research such as collecting the data with the various required methodological controls, was difficult at first. The evaluation of the data, the setting up of pilot studies, the statistical considerations and the control of sampling procedures were denied the psychologist by the nature of the field situation. In fact without the understanding and sup

port of the division psychiatrist the possibilities of even collecting the data would have been extremely limited. The priority of research, when there are patients available, is extremely low even for the curious psychologist.

By the time that a psychiatric casualty arrives at the U S Naval Hospital, Yokosuka, he has been screened at least four times. Often there is a marked change in the patient from the time he was initially evaluated. Some feel safe for the first time, others feel that they deserved to be sent to the United States immediately, and still others feel extremely resentful that they were not given another chance in combat.

STANDARD TESTS IMPROVISED

With the diagnostic tools available, a problem in initiative was often posed in improvising techniques and in the application of standardized procedures to patients. These patients as in many instances of combat injury, did not lend themselves to the administration of tests in the generally accepted manner. They were frequently bedfast and those with a variety of head injuries were often rendered deaf or mute. The diagnosis and operative procedures, both tentative and established by the medical officers at the time of referral, differed widely in their variety and in covering the interesting features.

To assist in meeting the problem of a heavy work schedule, enlisted hospital corpsmen with interest, education, experience in psychology, and maturity of judgment were selected to assist with the psychological testing. Their professional activities were confined to the administration of the nonprojective techniques and did not include evaluation or interpretation of the results. An effort was made to afford them opportunities for training, and for participation in staff conferences and research at their level of competence or understanding.

CONCLUSIONS

In terms of training, these experiences seem to emphasize the necessity for the psychologist to have a background of experience and contact with medical practices. This is best acquired in a hospital during his training period. In the field there is neither time nor available facilities for "looking up" information one does not possess.

Any long term procedure of psychiatric treatment of psychological follow up is not feasible under combat conditions. The emphasis is upon a rapid, accurate evaluation as to the patient's potential for further service and the likelihood of the facilities in the forward area being capable of assisting him to mobilize this potential. The farther from the active combat line the man gets

before treatment is begun, the less probable it is that he can be salvaged for additional effective combat service. The psychologist can expect to work well forward with troops in the field. As a corollary, the more advanced in training and experience the psychologist, the farther forward he can expect to work.

The clinical psychologist with his present-day training and diagnostic tools, is in a unique position to make a substantial contribution in this team approach to the psychiatric casualty in the field. In the field with combat troops, clinical psychology is offered a new opportunity for research theories, and broadening the entire scope of clinical practice. Of the psychologist it will require all of the diagnostic, some of the therapeutic, and most of the inventive capacities he possesses.

Joint Committee on Chest X Ray

In its recent report the Joint Committee on Chest X Ray of the American College of Radiology and the American College of Chest Physicians has this to say about double reading of roentgenograms:

The committee notes the several publications indicating the extent of false negative and false positive reports resulting from inter and intra individual variations in interpretations of chest films. From these it is evident that failures to detect tuberculosis can be reduced by multiple readings but at the expense of increasing the false positives unless a check mechanism is employed. The simplest elaboration of multiple reading is the independent interpretation of the film by two physicians with referee conference of the two undertaken in those cases in which they disagree. Only those cases on which both agree in conference should be followed.

While such a procedure may result in the detection of a slightly larger portion of all the abnormal cases, it may not be feasible from an economic or personnel standpoint. Groups responsible for survey operations are urged by the committee to give consideration to double reading as one of the methods by which survey yields may be increased. Availability of financial resources and qualified professional personnel as well as the need for other services of relative importance will be determinates in this decision. The committee therefore calls attention to some of the virtues of double reading but does not recommend it unreservedly.

DOCTOR-PATIENT RELATIONSHIP IN THE ARMY

FRANCIS W PRUITT *Colonel MC USA*

THE caliber of medicine has improved tremendously since the day, almost a quarter of a century ago, when my own intern class was assembled and given orientation. Certainly we were a much more bewildered lot than your group today. Improved patient care has been brought about by far sighted surgeons general and energetic hospital commanders dedicated to the care of the sick soldier. In the wisdom of their planning has been the concept that the hospital and its staff, both professional and administrative, exists for the patient. Over the years we have seen ever increasing progress to improve the patient's care and welfare, and to preserve his integrity as an individual.

An army's success or failure depends on the health of its soldiers. We are responsible for keeping the soldier healthy, physically and mentally. If he is disabled by injury or disease, it is mandatory that he be appropriately treated and returned to military effectiveness as quickly as possible.

The position of the physician in military medicine is somewhat comparable to that of our colleagues in industrial practice. The purpose of both is to give prompt treatment to the patient and to represent the employer's interests. The army physician, however, has a much greater opportunity to be of service to his patients because he is responsible for their care until they are restored to good health. In his hands may rest the life or death of the soldier on the battlefield or in the hospital. Where else could one find such a fertile field to practice the art and science of medicine? Your presence here today is indicative of your interest in military medicine. Some phase of this field of medicine has appealed to you and you wanted to become more familiar with it.

Whether the soldier patient is seen on sick call, on the battlefield, or in our large army hospitals, the medical officer has an

From *W. H. R. d Army Hospital W. sh agt n D. C.* Presented before new intern
1 o 30 Jun 1953

ample opportunity to practice the art and science of medicine. Let us consider the doctor patient relationship in each of these situations.

SICK CALL

After entering the Army, the soldier's first introduction to the medical officer is at sick call usually in a dispensary providing outpatient medical care for the soldier. This facility is not merely a first-aid station but a place intended to provide proper diagnosis, treatment and disposition as stated in Army Regulations.¹ Most soldiers seeking medical care at sick call do not suffer from serious conditions requiring hospital treatment but from relatively minor sickness, injury, or concern over personal health and welfare. If they are returned to duty without adequate examination, treatment and reassurance, they continue to worry about their health, lose confidence in the medical officers and become less effective in their assignments.

Good or bad, the soldier will base his impression of the professional care afforded by the Army Medical Service on the treatment afforded him at sick call. It is an opportunity for the alert physician to listen well, be of sympathetic understanding, examine carefully and prescribe with wisdom. All too often the soldier feels—and many times with justification—that not only has he been treated impersonally and inadequately but also without understanding and perhaps even callously.

Much could be said about the psychology of sick call.² When a soldier comes to sick call he has a reason although his symptoms may not be classic for any disease. Nevertheless, to him his appearance there is defensible. Something may have gone wrong with his job or in his company. He may believe the sergeant is "riding" him unnecessarily. The chief clerk may have blamed him for misdirected correspondence and his commanding officer is likely to have listened favorably to the complaints of the sergeant and chief clerk and then added his own displeasure. Hence the soldier follows his natural instinct and appears at sick call in a state of dyspeptic bewilderment. It may be his first appearance at this formation and he has no idea of procedure or what may happen to him. It is a common gripe³ among soldiers that the medical officer holding sick call will greet them with a sharp "What's your complaint?" stick a thermometer in his mouth and, if there is no fever, give him some pills or capsules and dismiss him with "Here, take this, it may help you."

The word complaint in medicine has a definite and specific meaning but it may have a different connotation for the layman, especially a soldier. Should we be surprised if he believes that

he is being accused of finding fault? He is coming to the doctor because he feels bad for one reason or another and is not lodging a "complaint" with the inspector general. Isn't it more friendly to call him by name and say, "Won't you sit down, Corporal Jones, and tell me about yourself?" Every soldier has a rating or grade and generally appreciates its being recognized. Respect his privacy and do not question him in the presence of other soldiers or technicians. He will be grateful for this.

EMOTIONS AND ILLNESS

It is well to remember that emotional strifes which may be trivial or unnoticed at home are magnified many fold in the barracks and by the rigors of field duty. Perhaps the soldier may have twisted his ankle playing softball, followed in sequence by disappointment over not being promoted and disapproval of a request for a furlough. Not only is the ankle more distressing than it ordinarily would be, but he may have indigestion as well. These are times when he hopes to find sympathy and understanding in the medical officer as he would in the family physician, and not be told "There is nothing wrong with you, you are just neurotic." Such a statement is an admission on the part of the medical officer of his inability to cope with the situation.

Remember some of your own emotional reactions at different times such as the polyuria and perhaps headache with nausea immediately preceding a difficult examination in medical school. Recently a national authority in medicine was scheduled to speak twice during a five-day medical meeting. He developed a severe, right-sided headache which persisted until a short time after his second appearance before the assembly; then it suddenly disappeared and did not return during the remainder of the meeting.

It is important, however, to rule out organic pathology before explaining the reasons for functional symptoms. When prescribing treatment at sick call, explain to the soldier why a particular medication is beneficial for his particular case, and under no circumstances turn to the medical technician on duty and say, "Give this guy some APC's."

Sick call is sometimes thought of as a haven for "goldbricks" and a formation which many soldiers use to dodge work. These repeaters at sick call can be detected by the careful physician. Each patient, however, should be given the benefit of the doubt. The understanding and interested physician can appraise these cases without difficulty. Even the professional "goldbrick," on careful questioning, will often lower his guard and reveal much that an indifferent physician would not elicit.

Although soldiers at sick call should be treated promptly and efficiently so that time lost from work may be kept at a minimum, the physician disposing of soldiers in a slipshod fashion is doing the Army, the soldier and himself an injustice. Show me a commander who objects to the medical officer taking sufficient time to make an adequate and analytical approach to his soldier's problem and I'll show you a mediocre commander. It is often rewarding to telephone the unit commander and inquire about one of his enlisted men who appears to have no organic basis for his symptoms. Remember that the Army is a cross section of our society temporarily set apart for definite and specific duties, and that you may expect to see the best as well as the less desirable specimens of American manhood. Sick call provides a challenge to the physician for he can learn a great deal from the clinical material and puzzling cases he sees.

EFFECT OF COMBAT

An extraordinarily important doctor patient relationship prevails on the battlefield where man's emotional disturbances may reach their greatest intensity. Here more than anywhere else the soldier looks to the medical officer in the role of the family physician for comfort and paternal guidance. Sgt. Jones may have received news from home that his mother has a goiter which necessitates a thyroidectomy. His apprehension is intensified by his absence from home and fear for his personal safety, and he seeks your assistance. When you have done your best to help allay his apprehension don't drop the matter. When in his company sector at a later date look him up and inquire about his mother. Most likely she will have convalesced from her operation and he will tell you about it with genuine appreciation. Incidentally you may be surprised to learn that after your visit Sgt. Jones lost no time telling others that the Doc is one swell guy."

It is well known that man becomes more religious during great danger and perhaps on the battlefield one sees a greater religious resurgence than in any other situation. The soldier comes to the medical officer for spiritual guidance in the absence of a chaplain. It is a compliment, indeed, for the soldier to seek from his doctor more than professional care.

Physicians have long recognized the euphoria of the wounded. For such patients a mangled leg means the war is over and they will return home. A great many have only a passing interest in their squad or platoon at this time. The euphoria may be short-lived as the wounded soldier realizes that he is now going to be dependent on others; hence a varying degree of depression results. Calmness of purpose and a cheerful attitude must be

maintained at all times in the management of these casualties. A word spoken carelessly about the soldier's condition or an apparently casual attitude will cause undue anxiety, and the soldier may lose confidence in you.

In modern times we hear much about shell shock or combat exhaustion in the American soldier. Here again the doctor in uniform can do much in his patient relationship. Immediately after the onset of the Korean conflict a psychiatrist was assigned to each division fighting there. His role in re-establishing self confidence in the combat soldier has not been given the recognition it deserves. In the division clearing stations it was a common sight to see a large number of these casualties spending two or three days undergoing a rest with sedation and hot food. It was gratifying that 60 percent or more of these men returned to combat effectiveness without being out of the division area. Officers and noncommissioned officers are not immune to this type of fatigue which frequently requires careful management. Self vilification may be apparent in this group if their unit has met stiff resistance in combat. In addition to blaming themselves for reverses, they may feel persecuted by their superiors. The understanding medical officer can be of great service in rehabilitating this group.

In forward combat areas the medical officer is limited in the amount of definitive therapeutics he can accomplish. He is often obliged to refer a patient to a rear hospital for a procedure he is capable of doing himself. The surgeon who says he could do the operation as well up front but he has orders not to, is on dangerous ground. As Churchill appropriately stated, such a medical officer is attempting to increase his prestige at the expense of the Medical Corps of which he is a member. "Doctors don't always stand on their professional dignity and integrity under these circumstances," he wrote. "One of the favorite topics at mess tables among lay officers and doctors is the management of neuropsychiatric patients. I've heard the most atrocious advice and criticism handed out to staff officers by uniformed doctors completely sabotaging the best efforts of the Medical Corps by undermining a trust that should be built up. Doctors would not think of doing this in private practice. They try to uphold the opinions of their colleagues or at least treat them with respect. But in the Army doctors are likely to forget that they are a part of the Medical Corps and that anything they tell the layman about the inadequacy of the Medical Department reduces the confidence of the very people they are there to support. * * * Doctors stand and fall together, and it is only by maintaining the professional dignity and the stature of the Medical Corps and the Medical Department that the mission can be accomplished. A

medical officer should do everything he can to support the team work of the Medical Corps and not behave as an individual seeking some special favor or prestige

"There is a unique dilemma that confronts the doctor in uniform. He represents the humanitarian and ethical standards of society and at the same time he represents the military as a soldier. Once a doctor relinquishes his ethical standards he is treading on dangerous ground because professional ethics as they pertain to the preservation of human dignity and the rights of a citizen soldier in a free society, must be preserved. * There is a part of the doctor's function which if he will preserve it is not subject to command for it resides in what we recognize as the ethics of our profession. Under the trying emotional and brutal atmosphere found in warfare it is of utmost importance that these ethical standards be preserved."

PATIENTS IN HOSPITALS

The patient relationship in this hospital, will be a vital part of your life in the year just ahead. You are eager to carry out your plans of the practice of medicine according to the ideals you have formulated through your years of education. All of us enter this exciting field with a burning desire to emulate the manner of our favorite professor of yesteryear. Such an ideal could not be more commendable if the professor were one of the masters who practiced the art of medicine as well as the science. We all admire the clinician who treats a sick patient with heart disease and have less esteem for the physician who treats only a diseased heart in a man. Too frequently we see young physicians who know much about mice but little about men. One does not need to spend much time in a ward to know whether the patient-doctor relationship is of a high order or whether it is deplorable. What makes the difference? It is the physician, nurse and corpsman. All too often hospital wards are operated as dehumanized machines.

The average patient arrives at the receiving office of the hospital usually after being shaken up in an ambulance. A clerk rapidly questions him about his next of kin and service number. He is seen briefly by the admitting officer who exhibits only a passing interest in him. Someone takes his clothes and valuables. He is given pajamas which may not fit. He is wheeled to the ward in darkness and finds himself in strange surroundings, in a bed high off the floor and alone, lonesome and forlorn. It is no wonder that the first person to greet this new patient on the ward and especially the intern makes such a profound impression.

One of you may be the first to see him. Make full use of this moment. Approach him with calmness of purpose, sympathetic understanding, alertness, and listen well. He will respond better and have more confidence in you if you will spend 30 seconds getting acquainted. Ask the soldier his name and introduce yourself. Inquire about his organization, you might have mutual acquaintances. Praise his organization in some small way, tell him you have heard it is a fine outfit. Never miss the opportunity to ask him about his home town. You might have relatives or friends there. You may have even visited his home town. If so, his face will light up immediately, he will feel a stronger bond, and you have gone a long way. Never hurry. "Hasty climbers have sudden falls," and many of our diagnostic downfalls are attributable to hurried examinations rather than to lack of knowledge. Do not exhibit impatience or he will believe that you are not interested in his case. Cultivate the faculty of being a good listener. Many a ward officer has been embarrassed when the staff physician on ward rounds listened to the patient's story without interruption and elicited an important clue to the diagnosis which was missed because of a hurriedly taken history. By the time you have completed his history and physical examination, he will consider you his personal physician. The staff man may come and go, but you are his doctor.

NEEDLESS TESTS

A word of caution: there is a tendency to rely on laboratory tests and roentgenograms out of proportion to their value. The average patient has been brought up to believe that a roentgenogram will reveal the cause of his trouble but the physician should request diagnostic procedures with profound thought. It is poor practice of medicine to subject a patient to unnecessary tests. A patient may rightly feel that he is going through all these examinations because his physician does not know the answer to his trouble.

As the eminent physician, Francis Peabody,* points out, "Once your relationship with him has been established, you must foster it by every means. Watch his condition closely and he will see that you are alert professionally. Make time to have little talks with him—and these talks need not always be about his symptoms. Remember that you want to know him as a man, and this means you must know about his family and friends, his work and his play. What kind of a person is he—cheerful, depressed, introspective, careless, conscientious, mentally keen or dull?" If you feel that such remarks belong to the days of horse and buggy medicine you should be interested in reading Dr. Alvarez's⁴ book, "Neuroses," in which he writes "Patients often resent

our lack of interest in them as human beings. Many a person has said to me "That surgeon may have saved my life but I dislike him and always shall because he had no interest in me aside from my gallbladder every time during those three weeks when I tried to be friendly he rebuffed me or he walked coldly away without a word. In answer, many a surgeon will say, "How, during my hurried morning rounds can anyone expect me to stop for a chat?" That is true but I cannot get over the fact that some of the busiest surgeons I have known did manage often to stop for a moment to ask a kindly question or to say a comforting word. And, with this some of them did grip their patients to them with bonds of affection and lifelong devotion. Evidently it can be done. You cannot know your patient too well.

THE PATIENT IS A PERSON

A great many physicians make the mistake of losing the patient's identity and he is referred to as "the patient in bed 10" or "the case of sarcoidosis." You will enhance your prestige by remembering his name when you make rounds. Neither should a patient be referred to as "this boy" or "this guy"—the soldier resents it. He wants to believe he belongs to somebody and will react in a much more friendly manner if referred to by name. You will have a staunch admirer too, in case you and he are from the same state if you refer to him as another Hoosier or the like. In the event your diagnosis is not apparent by this stage, you are not wasting time to sit down again with your patient and review his symptoms. You are frequently rewarded. This is an excellent time to inquire about his personal life. It is not unusual to uncover a history of syphilis contracted during some illicit amorous moment that has produced a fixation in the patient. I recently saw such a patient who had infected his wife. He became obsessed with a guilt complex resulting in his hospitalization for constant headaches. The first physician to see him made a presumptive diagnosis of intracranial tumor and had the patient evacuated across the Pacific as a medical emergency. A more careful physician in whom the patient had confidence elicited the story of the patient's dilemma and after appropriate management he was returned to effective military duty.

I have dwelt on functional manifestations in our relationship with patients. It takes an astute physician to solve some of these perplexing problems. Let us not be too hasty in telling a patient he or she is neurotic when we are unable to find any organic pathologic condition on early examinations.

Many patients' future outlook has been effected by such injudicious management and equally as many physicians' reputations and prestige have suffered. This unfortunate affair in

volves women more than men Too frequently patients with myxedema, thyrotoxicosis without exophthalmos, or abdominal symptoms due to internal hernia or gastrointestinal lesions are given an erroneous label of psychoneuroses Such errors are inexcusable Not long ago a patient who was a nurse was admitted from another hospital with a diagnosis of psychoneurosis She had some discomfort in the left flank and the first physician, after an inadequate investigation, labeled her as a frustrated woman A second physician handled her equally poorly and agreed with the first doctor The miserable girl was beside herself A more careful physician, while on evening rounds, sat down for an interview She calmed herself and gave him a history of distress along the region of the left ureter The next day she was referred to the urologist who found a narrowing in the ureter which responded well to dilatations The symptoms disappeared and she returned to duty It is needless to describe her feelings toward the first two physicians Fortunately or unfortunately, a staff nurse can have much to do with a physician's professional reputation

Choose your terminology well when discussing the patient's condition with him Accustomed as we in medicine are to arteriosclerosis, this term may frighten unnecessarily the introspective patient whose mother's terminal illness was due to this condition Would it not be kinder to tell him you have found only the changes incident to aging? After all, what therapeutic measures have you to offer him for such a condition? Before the days of antibiotics, the parents of a young girl who died following an appendectomy were highly indignant because the surgeon told them he had "torn away some adhesions at operation" Had he been more gentle, reasoned the parents, their daughter might still be alive

DRUGS AND DIETS

How else can we improve our relationship with the hospital patient and hasten his convalescence? We are accustomed to prescribing drugs and special diets for our patients, and dismissing the matter Generally we can be assured that the nurse is making certain that medications are properly administered to the patient, but what about his meals? You prescribe a specific diet, the dietitian highly trained in her own right, computes it and makes certain that it is on its way and is as tasty as it can be made The floor nurse sees that it gets to the bedside, and hurries to lunch A week later you are surprised to learn that your patient has lost weight Make it a practice to see the patient's tray at the bedside You will then know the proper food is reaching him and he will appreciate your interest Do not dismiss the matter but inspect his tray after it has left the bedside and note the amount and type of food rejected Call the

chloride in 5 percent dextrose in water was used where the maintenance of muscular relaxation was desired

RESULTS

The patients were divided into three groups, according to the method and purpose for which the succinylcholine was used. Group 1 consisted of those patients who received a single dose of succinylcholine chloride to permit intubation. Group 2 included those patients who received succinylcholine in a 0.1 percent solution by continuous drip for maintenance of muscular relaxation. Group 3 were the patients who received a priming or intubating dose of succinylcholine plus the continuous drip.

Group 1 had a total of 124 patients. Results were satisfactory in 121 (97.5 percent) and unsatisfactory in three (2.5 percent). Conditions were satisfactory when the degree of muscle relaxation permitted easy introduction of a laryngoscope and exposure of the larynx. Conditions were unsatisfactory when the jaw and neck muscles were not relaxed for laryngoscopy or if prolonged respiratory depression occurred. Ninety-nine (79.8 percent) of these patients received thiopental sodium with nitrous oxide and oxygen, while 25 (20.2 percent) received thiopental sodium with nitrous oxide, oxygen and ether. The average dose of succinylcholine for intubation was 30 mg.

Of the three patients with unsatisfactory results, one received a dose of 40 mg of succinylcholine but had very poor relaxation of the jaw and neck muscles. A second dose of 40 mg five minutes later produced good relaxation. Endotracheal intubation was then carried out easily. Another patient received two doses, each of 40 mg, three minutes apart but had poor muscle relaxation. He was further anesthetized with ether and endotracheal intubation was accomplished. Succinylcholine may have been hydrolyzed by the thiopental sodium still in the intravenous tubing in both instances. The third patient had received morphine and scopolamine for preanesthetic medication and had respiratory depression for 45 minutes following thiopental sodium and succinylcholine administration. He subsequently came to surgery at a later date and received meperidine hydrochloride and atropine premedication. After induction with nitrous oxide, oxygen and ether, succinylcholine was used for intubation. The patient had no respiratory depression. The unsatisfactory response during first anesthesia may have been due to the premedication or the thiopental sodium.

The single intravenous injection of succinylcholine chloride gave jaw and neck muscle relaxation within 60 seconds. With the exception of prolonged respiratory depression in one patient, the effects of the succinylcholine began to subside in three minutes.

and apparently had completely disappeared in five minutes. No patient showed any significant blood pressure change.

Group 2 consisted of 16 patients (fig. 1) who received 0.1 per cent solution of succinylcholine by the drip method for maintenance of muscular relaxation. This technique was used in those

UPPER ABDOMINAL (5)	RELAXATION	EXCELLENT	4
		FAIR	1
		POOR	NONE
	INHIBITION OF RESPIRATORY EXCHANGE	MARKED	NONE
		MODERATE	4
		SLIGHT	1
LOWER ABDOMINAL (14)	RELAXATION	EXCELLENT	11
		FAIR	NONE
		POOR	NONE
	INHIBITION OF RESPIRATORY EXCHANGE	MARKED	NONE
		MODERATE	3
		SLIGHT	8

Figure 1 Results obtained with succinylcholine during surgical intervention in the 16 patients of group 2.

patients in whom endotracheal intubation was considered unnecessary, for example, inguinal hernioplasty and small ventral hernial repairs. In 15 patients (93.3 percent) the degree of muscular relaxation was excellent, while in one patient (6.7 percent) it was only fair. Relaxation was considered excellent when the surgery was accomplished with ease and without muscular tension. It was considered fair when the musculature was only partially relaxed and some tension was noted by the surgeon on retraction. Relax-

to inflation the respiratory depression is probably due to the barbiturates or premedication or both

Intubation can be accomplished with the continuous drip if a sufficiently rapid flow of the drug is used but this increases the volume of intravenous fluids In some patients this additional volume might be undesirable Foldes and associates have used a 0.2 percent solution of succinylcholine which resulted in the same degree of muscular relaxation with a slower rate of drip and a smaller volume of intravenous fluids

If succinylcholine and thiopental sodium are accidentally mixed in the rubber sleeve of the intravenous infusion apparatus a white precipitate will result Succinylcholine is slightly acid (pH below 7) while the sodium salts of the barbiturates are alkaline (pH 9 to 10) Succinylcholine is rapidly hydrolyzed and loses its potency if it is mixed with any alkali Therefore, if thiopental sodium with nitrous oxide and oxygen is the technic of maintaining anesthesia a separate venopuncture should be used for giving succinylcholine

The degree of muscular relaxation can be controlled by a variation in the rate of drip depending on the depth of the anesthesia The greater the depth of ether anesthesia the slower was the rate of flow of the drug needed for satisfactory muscular relaxation The patient must be adequately anesthetized and the muscle relaxant not used to abolish the motor response to sensory stimuli Succinylcholine is not an anesthetic agent but is an adjunct

Rapid onset and short duration of action are the principal advantages of succinylcholine There is no prolonged period of apnea which always carries the danger of hypoventilation Decamethonium bromide (succinylcholine), tubocurarine chloride, or flaxedil [Tri (diethylammonioethoxy) benzene triethyloxide] can be used following succinylcholine if time is allowed for the hydrolyzation of the succinylcholine The reverse is also true Flaxedil and tubocurarine chloride would be expected to inhibit the action of succinylcholine if the latter is given during the effective period of either This is because tubocurarine chloride and flaxedil block the depolarizing action The effect of succinylcholine would be prolonged by decamethonium bromide because this also acts by depolarization Neostigmine or other anticholinesterase, procaine and tensilon chloride would also be expected to prolong the effect of succinylcholine

There was no increase in the incidence of such postoperative complications as atelectasis paralytic ileus, or pneumonitis in this series over other forms of inhalation anesthesia There was no mortality associated with the use of this drug

SUMMARY

In a series of 205 patients, given succinylcholine chloride intravenously, the results indicate that, when given in single injection, this drug produced conditions ideal for laryngoscopy in 97.5 per cent of the patients. When used as 0.1 percent continuous maintenance drip, succinylcholine produced excellent muscular relaxation in most patients. The advantages of succinylcholine lie in its prompt and short action and its lack of histamine like depressor response. It is important to realize that succinylcholine is not an anesthetic agent, but an adjunct for muscular relaxation.

ADDENDUM Since the original portion of this report was written succinylcholine has been used in 230 additional patients. Of this number 123 belong to group 1 with 2 unsatisfactory results (1.6 percent). Thirty-three were in group 2 and 74 in group 3 all with satisfactory results.

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Endocrine Therapy in the Menopause

One of the greatest abuses of endocrine therapy is in the management of the menopausal vasomotor symptoms. Most of these women need no estrogen therapy at all. All that we can aim to do with estrogens is to tide the patient over certain little symptomatic bumps that she experiences during the period of transition. The majority of women can readily tolerate these symptoms and they are much better off to be given no estrogen at all and get the readjustment over with. But if we keep pumping into these women the very substance that their economy is trying to get along without we only prolong the menopause. You all have seen women who have been given "shots" for many years which is never necessary. Those are the women we have to think about in connection with cancer.

—EMIL NOVAK, M.D.
in *Rhode Island Medical Journal*
p. 573 Oct. 1953

MEDICAL CONSIDERATIONS IN HELICOPTER EVACUATION

SPURGEON H NEEL Jr L t t C lo t MC USA

HELICOPTER evacuation of the seriously wounded from the forward combat area is a sound and feasible medical practice. It has been battle tested in Korea and subjected to formal field testing within the zone of the interior. While current organizational structure and various helicopter models are still under evaluation, it is generally accepted that ambulance helicopters under the control of the Army Medical Service will contribute materially to the medical service of any future military operation.

Battle and training experiences have indicated a requirement for more understanding regarding the role of helicopter evacuation within the overall medical effort in forward combat areas. Full exploitation of the capabilities of helicopter evacuation depends upon a sound understanding of the medical and tactical considerations involved. The surgeon who best understands the principles and procedures utilized in helicopter evacuation can best exploit its capabilities in the care of the individual casualty and the command. The basic procedures used in helicopter evacuation are prescribed in Department of the Army Training Circular Number 32, 1952. Ground assistance required for helicopter operations is described in Department of the Army Training Circular Number 22, 1952. Tactical considerations in helicopter evacuation will be the subject of a separate article. Organizational and developmental matters are likewise beyond the scope of this discussion.

Air evacuation under the control of the United States Air Force has been proved the primary and best means of moving casualties between the combat zone and the communications zone or the zone of the interior. Normal air evacuation is used after the casualty has been moved into the army service area and has received initial surgical intervention. In the forward combat area, however, the majority of casualties will continue to move by surface evacuation.

From U S. Army Medical Field Service School For Sam Houston, Texas Col N L now
Headquarters 30th Medical Group APO 301 San Francisco

With the advent of helicopter ambulances, air evacuation has been pushed steadily forward until it is now available within the regimental area. Every field surgeon is now concerned with air evacuation and must appreciate its capabilities, limitations, and procedures, and, most of all, his own responsibilities. Helicopter ambulances are but auxiliary means of evacuation. They supplement, but do not replace in any way, conventional surface means of evacuation. Helicopter ambulances afford the forward surgeon greater speed, flexibility, and selectivity in evacuation but he must realize that he has accrued many new responsibilities with helicopter evacuation.

The advantages, or capabilities, of helicopter evacuation can be considered under five major headings: (1) speed in evacuation, (2) flexibility of medical service, (3) patient comfort, (4) selective evacuation and (5) economy. All of these factors reduce the mortality and morbidity of the individual casualty, and improve the medical practices within the command. An understanding of these considerations will facilitate exploitation of helicopter evacuation and the better integration of its capabilities into the overall medical support of the command.

SPEED IN EVACUATION

Speed in evacuation is most important in the severely wounded. Casualties are a "perishable commodity." They cannot be "stock piled," but must receive proper treatment as early as possible. A man dies in so many minutes, not over a distance of so many miles. Any measure that will reduce the time lag between wounding and treatment will reduce both the mortality and morbidity of war wounds. The ambulance helicopter gives more rapid evacuation in two specific ways. Its speed over unfavorable terrain permits the rapid evacuation of casualties from the forward pickup point to a medical facility capable of initial surgery anywhere within the army service area. This, in effect, places all hospitals and special treatment centers in direct support of the regimental or battalion surgeon. Secondly, the minimum landing site requirements of rotary wing aircraft permit their use well forward.

A basic principle of field medical service is flexibility, which is enhanced by the use of helicopter ambulances. The speed and range of rotary wing aircraft and their minimum landing site requirements permit their concentration whenever and wherever required. Thus, the controlling surgeon can quickly shift his evacuation means to support any unit which is becoming immobilized with severely wounded casualties. The surgeon now has the capability of evacuating and providing limited medical resupply to units which are isolated by enemy action or terrain.

The importance of flexibility of medical service is increasing with the advent of new "mass destruction" weapons and the tactical concept of defense on a wide front with small relatively isolated units.

Comfort of the patient is not merely a luxury. Antitraumatic evacuation is essential if shock is to be prevented or minimized. Proper preparation of the casualty for evacuation is as important when using helicopters as any other evacuation means. With helicopter evacuation the casualty not only reaches the proper treatment facility faster but also in much better condition. Helicopter evacuation is in no sense a form of treatment, but it is a valuable adjunct to subsequent surgical intervention in that it moves the casualty to the surgeon in the shortest period of time and in the best possible condition.

SELECTIVE EVACUATION

Selectivity in evacuation is less obvious than the other factors listed and bears further consideration. Evacuation is no longer limited so that all casualties must move to the particular hospital supporting the major tactical command. The speed, range and flexibility of helicopter evacuation permit the removal of the casualty to the treatment facility best equipped and staffed for his particular type of wound. The effectiveness of this procedure depends on helicopter ambulances remaining under medical control and the co-operation of forward surgeons in providing adequate clinical information.

Economy may sound paradoxical when one considers only the cost of the individual helicopter ambulance. Actually, the proper use of helicopter evacuation permits considerable economy in medical means. Specialized personnel can now be concentrated in designated treatment facilities located well forward in the combat zone and there is no need for equipping and staffing every forward hospital for the care of every type of casualty. More and better surgery can be provided with less personnel. When one considers the value of the individual soldier including both his military and subsequent civilian contribution, the true economy of saving a life becomes obvious.

These five basic advantages of helicopter evacuation bear analysis by all concerned with the use of the helicopter ambulance but particularly by the field surgeon due to his key role in forward air evacuation. Full use of helicopter evacuation depends on the intelligent co-operation between the medical officers located in forward installations and the pilots of ambulance helicopters.

A brief consideration of the limitations of forward helicopter evacuation will assist the field surgeon in maintaining a proper perspective. The helicopter ambulance is no panacea. Most limitations can be minimized if they are understood and steps are taken to circumvent them or prevent undue interference with forward medical support. The limitations of the ambulance helicopter can be considered under four general headings (1) cost, (2) maintenance requirements, (3) sensitivity to weather and darkness, and (4) tactical integration.

The cost of each ambulance helicopter will constitute a limitation on the number that will be available to the Army Medical Service. The H 13 aircraft, which transports two litter patients externally, costs about \$34,000. The H 25 aircraft which transports three litter patients internally, costs about \$340,000.* Compare these figures with the \$4,621 that will buy a field ambulance capable of transporting five litter patients. High skill and training requirements of pilots and maintenance crew contribute even further to the expense. The cost can be minimized by insuring that ambulance helicopters are used with maximum efficiency and that they are reserved for emergency evacuation of severely wounded casualties requiring immediate initial surgical intervention or routine evacuation from isolated military units where other means of evacuation are not feasible. The helicopter, like any other type of aircraft, is of value only when flying. Delay at either terminus in air evacuation, whatever the cause, increases the relative expense of the aircraft by wasting its usefulness. Lack of information in request for a helicopter and slowness in loading procedures are the most common sources of delay in helicopter evacuation.

In Korea the ratio of maintenance time to flying time was found to be about 6:1. While maintenance is not strictly a medical problem, field surgeons should appreciate its requirements when projecting the use of helicopter evacuation for a particular operation.

Helicopters are very sensitive to weather and darkness. Instrument equipment is limited and the pilots normally fly VFR (Visual Flight Rules) which preclude their use when ceiling or visibility are below minimum standards. Night evacuation missions are rarely flown. Only when there is a most urgent need when the pilot has previously entered the area and when the landing site can be lighted can pilots safely execute night evacuation missions. This requires the maintenance of an effective surface evacuation system. Provision must be made for

* Price based on minimum quantity orders.

initial surgery well forward within the reach of surface evacuation to cover those periods when helicopter evacuation is not available

TACTICAL INTEGRATION

Helicopter evacuation poses many problems which are new to the Army Medical Service. A full discussion of these problems is being made the subject of a separate article but the field surgeon should realize their impact on medical practices in the forward combat area. While most of these considerations are nonmedical the field surgeon must know all the factors which influence the care and evacuation of casualties to develop sound forward medical practices. Among the problems inherent to integration of helicopter evacuation are site selection and marking, control of aircraft in flight, visual and electronic air-ground communications, co-ordination of supporting fires with helicopter sorties, preservation of concealment of forward medical and tactical installations, and safety.

The surgeon exercising detailed control of helicopter sorties receives evacuation requests through medical channels over common user electronic facilities. Each request contains appropriate clinical information on each casualty plus data on the place and time pickup is desired, the marking of the site and required tactical information. Each intervening surgeon has screened the request and established priorities where indicated. Based on this information the surgeon exercising operational control over helicopter evacuation dispatches individual helicopters with instructions as to the proper destination of casualties. These are medical decisions and can be made only by those with sufficient training and experience.

SELECTION OF CASUALTIES

The selection of casualties for helicopter evacuation is normally the initial problem confronting the field surgeon using helicopter ambulances. Considerations involved include (1) the nature and severity of the casualty's condition (2) the availability of helicopters for evacuation (3) the number of casualties requiring expeditious evacuation and (4) other means of evacuation available.

The following types of casualties should be evacuated by ambulance helicopter to the nearest medical facility capable of the type of initial surgery required: (1) casualties in shock who have been in shock and those with continuing hemorrhage (2) all traumatic amputations (3) open fractures of long bones complicated by shock or hemorrhage or without complete and

comfortable immobilization, (4) wounds of the extremities with impaired blood supply, or with a tourniquet in place, or with history of tourniquet application, (5) wounds with extensive muscle damage, (6) abdominal wounds (7) all sucking chest wounds, (8) chest wounds in which there is any degree of respiratory difficulty or dyspnea, (9) all thoracoabdominal wounds, (10) maxillofacial or neck wounds that are severe or in which there is respiratory difficulty (11) head injuries in coma with signs of increased intracranial pressure, and (12) suspected gas gangrene. These are the same type of casualties that are eligible for initial surgery in the mobile army surgical hospital when helicopter evacuation is not available.

There will rarely be sufficient helicopters to evacuate all these casualties. The medical officer must, in each case, decide which of the more seriously wounded are to be evacuated by helicopter and which by field ambulance. This is a matter of clinical judgment, and "rules of thumb" are not only useless, but dangerous. When making such decisions, the surgeon considers the time separating his installation from the mobile army surgical hospital. It is poor medical practice to delay unduly the evacuation of a casualty pending availability of a helicopter ambulance when it is feasible to expedite his evacuation by field ambulance.

Any casualty that is at all transportable is transportable by helicopter. The low altitudes and short flights characteristic of helicopter evacuation permit transportation of casualties who might be unsuitable for evacuation in fixed wing aircraft. The principal limiting factors in air evacuation are altitude pressure changes and, to a lesser degree, anoxia. Neither of these two limitations is significant in helicopter evacuation.

PREPARATION OF PATIENT

In the preparation of casualties for helicopter evacuation, hemorrhage must be controlled and treatment for shock must be instituted and continued while waiting for the arrival of the helicopter ambulance. The casualty should have a systolic blood pressure of at least 80 mm Hg and an adequate airway must be established. Prior to take off, the casualty's tracheobronchial tree should be emptied of any blood or mucus. Those with severe maxillofacial injuries should be evacuated in a prone position to prevent aspiration of vomitus in event they should become air sick. Rarely, tracheotomy may be indicated. Fractures should be immobilized and adequate sedation should be given to reduce pain and shock. Open chest wounds, whether sucking or not, should be tightly bandaged. In short, all possible medical care should be given the casualty prior to take off without delaying his evacuation.

Limited medical treatment can be continued in flight if the casualty is evacuated in cargo-type helicopters. These helicopters may carry a medical attendant in addition to the pilot who is also a qualified medical assistant. It must be realized that although helicopter ambulance pilots are qualified medical assistants their medical function in flight is limited to judgment because they are too occupied flying the aircraft to devote any direct attention to casualties. If treatment is to be continued in flight detailed instructions should be given to the medical attendant. Active medical care in flight is impracticable when casualties are evacuated in utility type helicopters such as the H 13 because the casualty is carried on external litter racks.

Helicopter evacuations normally terminate in evacuation hospitals. Use of an evacuation hospital rather than a mobile army surgical hospital as the rear terminus for helicopter evacuation is preferable because transportation of casualties from the regimental area to a properly located mobile army surgical hospital (within the division area) does not fully make use of the speed and flexibility of helicopter evacuation. The capacity of the mobile army surgical hospital should be conserved for severely wounded casualties which exceed the capabilities of available helicopter evacuation. At night and during inclement weather it is advantageous to have beds and medical personnel ready in the mobile army surgical hospital to care for all casualties pending the resumption of helicopter evacuation support. In Korea the rear terminus for helicopter evacuation was the mobile army surgical hospital but there until late in the campaign the mobile army surgical hospital usually functioned as an evacuation hospital and was located from 30 to 60 miles behind the line of contact. This validated the procedure recommended rather than being an exception.

The helicopter ambulance like any other ambulance is capable of limited medical resupply. Whole blood, plasma, biologics which have extreme storage requirements or short expiration dates and other urgently needed medical items are advantageously distributed by air. Routine evacuation of tactical units isolated by enemy action or terrain can be done effectively by helicopter. River crossing and amphibious operations are good examples of this latter use. The ferrying of patients from army medical installations to U. S. Navy hospital ships located off shore is another effective use. Helicopters afford considerable flexibility in meeting unforeseen medical requirements in rear areas such as are incident to area damage control operations.

SUMMARY

The helicopter ambulance has won a place in the Army Medical Service. It is not contemplated that helicopters will ever be available in sufficient quantities to replace conventional surface means of evacuation, nor that such would be desirable. The role of the helicopter ambulance is that of an auxiliary means supplementing, but not replacing, field ambulance evacuation in the forward combat area. Helicopter ambulances must be under medical control to achieve the selectivity in evacuation that is inherent to utilization of helicopter evacuation. The field surgeon must understand the capabilities and, even more important, the limitations of helicopter evacuation. He must accept his own responsibilities as a member of the ground air team that is essential to the full value of forward air evacuation. It is not a matter of whether the Army can afford to use helicopter ambulances but more a matter of whether we can afford *not* to use them.

The Unconscious Patient

Adequate care of an unconscious patient is a time-consuming meticulous task demanding the best efforts of both physicians and nurses. This is becoming more evident with the mounting number of malpractice suits and the quickening of public attention to any indication of neglect. The cause of unconsciousness is immaterial. Diabetic and uremic coma, cerebral vascular accidents, head injuries, brain tumors, and even relatively normal individuals during anesthesia present similar problems in care. More often than not, the very survival of such patients depends upon the type of treatment which they receive.

The most important single factor in the success of such management is the state of mind of the physician and nurse in charge. Unconscious patients are utterly helpless. They are unable to warn their attendants of muscle strain, joint trauma, eye injury, overdistention of the bladder, or tracheal obstruction. They feel no pain and would be unable to show any indication of it even if they did. The doctor therefore must constantly be alert to possible injury as well as to the needs of their nutritional and metabolic functions.

—From an editorial in GP p. 29 Sept. 1953

Dr Frank B Berry Named Successor to Dr Casberg



Frank Brown Berry M D F A C S Professor of Clinical Surgery at Columbia University College of Physicians and Surgeons has been chosen to succeed Melvin A Casberg M D as Assistant Secretary of Defense (Health and Medical) Dr Berry served as a medical officer in both World Wars and is a reserve brigadier general in the Medical Corps of the Army He is a graduate of Harvard Medical School and a founder member of the American Board of Surgery and of the Board of Thoracic Surgery Since July 1946 he has served as a national consultant in his specialty to the Surgeon General of the Army and since 1948 has been a member of the Committee on Medical Sciences Research and Development Board

INTRA-ARTERIAL TRANSFUSION

SAM F SEELEY *Brigadier General MC USA*

ON admission to the emergency room or the forward surgical hospital near the battlefield, patients suffering from shock can rarely be subjected to scientific measures designed to determine the degree of blood or plasma loss. There are no laboratory devices which are capable of measuring rapidly either the blood volume or the degree of vasoconstriction which reduces the capacity of the vascular space. When profound shock is present, it is necessary to bring about prompt resuscitation by adequate replacement either with blood alone, or with blood and plasma, or plasma expanders. During World War II a sufficient amount of blood was available to resuscitate those in moderate shock due to massive tissue destruction or marked blood loss. Even at that time, pressure transfusion was rarely used. Special research in Korea, where pressure transfusions have been used, further demonstrated that in patients with massive wounds involving bone and muscle, from 20 to 30 pints of blood have been required to bring about resuscitation for reparative surgery, and to sustain the circulation during the early hours of recovery.

Successful replacement of blood volume loss depends on the speed of administration as well as the adequacy of replacement. Administration of large quantities of blood under pressure by the venous route will suffice in the majority of instances when the heart beat is discernible. When the blood pressure cannot be ascertained or is very low, and even in instances when it is certain that the heart is not beating, successful resuscitation has been accomplished by intra-arterial blood transfusion. To bring about tissue perfusion of the viscera, skeletal structures, and the myocardium, it is necessary that an optimal pressure be maintained in the major arterial vessels. Resuscitation of the excised mammalian heart was reported by Langendorff in 1895 by perfusion of the aortic stump with normal saline solution under pressure. Kulibakko, in 1902, restored the contractions of the excised heart of a three-month old child, 20 hours following death, by aortic perfusion with defibrinated oxygenated blood. In the

From Walter Reed Army Hospital, Walter Reed Army Medical Center, Washington, D. C. Presented at the annual meeting of the American Medical Association, New York, N. Y., 4 June 1953.

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absence of the heart beat blood given by the venous route cannot be carried by the right heart through the pulmonary tree Applying this principle Glasser and Page bled 39 animals until breathing stopped for an average of five minutes and the heart beat stopped for two minutes Intra arterial administration of blood resuscitated 84 percent of the animals 51 percent survived for an average of 10 hours and 33 percent recovered

Since the early reports on intra-arterial transfusion many articles reporting the dramatic resuscitation of patients whose recovery would be doubtful if intravenous transfusion alone had been employed have appeared in the literature However some clinicians are using intra-arterial transfusion where this method is not indicated In patients in mild or moderate shock due to blood loss transfusions by the venous route suffice In patients in profound shock the rapid resuscitation that follows intra-arterial transfusion makes it possible to switch to the venous route for the completion of resuscitation and the maintenance of blood volume in the presence of moderate continuing hemorrhage When severe hemorrhage has not been brought under control continued administration of large amounts of blood by the arterial route may be necessary

It has been my experience that arterial transfusion should be employed in profound shock when the pulse and blood pressure are not obtainable or in moderate or profound shock when pressure transfusion by the intravenous route is failing

CHOICE OF ARTERY

Any artery large enough to accommodate a 15-gage needle or arterial cannula is suitable The most accessible artery nearest the aorta is preferable While the radial artery is most frequently chosen congenital absence of deep palmar arch anastomoses may result in gangrene of the hand if that artery is sacrificed The radial artery should not be ligated If the brachial or femoral arteries are used the application of a tourniquet distal to the site of transfusion reduces pain and vasospasm in the extremity and avoids the enforced perfusion of blood with a low oxygen content An extremity will survive with the application of a tourniquet if the period of time does not exceed that necessary in orthopedic operations under tourniquet control

If a laparotomy is performed the aorta is a favored site for intra arterial blood transfusion In a thoracotomy, the thoracic aorta may be used Transfusions have been given into the left ventricle In Korea it was found that an excellent site is any major artery exposed in severe wounds of the extremities

SPEED OF TRANSFUSION

Blood should be given by the arterial route at a speed sufficient to bring about prompt filling of the arterial system. As the circulation improves and arterial blood is carried forward in the circulation and vasoconstriction relaxes, transfusion may need to be continued until the entire circulatory system has become filled. Pressure cannot be developed within the arterial system until a sufficient amount of blood has been given to exert pressure against the walls of the great vessels. This is comparable to an elastic fire hose which must be filled completely before pressure can be exerted on the nozzle. Speed of transfusion is dependent upon the caliber of the needle and the pressure exerted on the column of blood. A 15-gauge or larger needle or cannula should be used. Pressure of from 200 to 300 mm Hg under these conditions will permit the administration of large quantities of blood in a short time.

AMOUNT OF BLOOD GIVEN

Sufficient blood must be given to build up a pressure gradient within the major arteries. This must be followed by a sufficient amount to maintain adequate perfusion pressure within the arterial system after vasorelaxation has occurred. It is my custom to use the arterial route until the pulse rate has been reduced to 120 or less per minute or the systolic blood pressure has reached 80 mm Hg—whichever occurs first. If, at this time constriction of peripheral veins has relaxed and the venous route can be employed, intra arterial transfusion is delayed by equalizing the pressure in the transfusion apparatus with that of the patient's systolic pressure but leaving the needle in place. If intravenous transfusion then proves adequate, the arterial needle is withdrawn.

SUBSTANCES USED

Under grave emergency conditions I have employed normal saline solution or dextrose solution pending the arrival of plasma expanders, plasma or blood. While whole blood is most desirable, occasionally substitutes must be used to maintain life until blood is procured.

COMPLICATIONS

Air embolism is the greatest hazard in intra arterial transfusion. This can be prevented by exercising care to prevent the egress of air into the circulation. A pressure bulb should never be attached to the transfusion apparatus unless a responsible person is in constant attendance. The threat of air embolism may be

overcome by the use of elastic bags containing blood but no air. Pressure is exerted onto the bag by placing it under the patient's buttocks or back thus forcing the blood into the patient's arteries.

Gangrene may develop at a point distal to the site of intra arterial blood administration. To prevent gangrene arterial transfusion should be continued only to the point where venous administration will suffice. The closer to the aorta the blood is administered the less is the threat of gangrene. Application of a tourniquet as described is helpful.

SUMMARY

Intra arterial blood transfusion is effective in resuscitating patients in profound shock. It should be employed promptly administered rapidly and discontinued as soon as it is found that the intravenous route of administration will sustain the circulation. Pressure perfusion of the great vessels may be helpful in restoring the heart beat in cardiac arrest. A nonbeating heart cannot be expected to transfer blood from the venous side across the pulmonary system to the aortic arch. A pressure head at the coronary vessels is mandatory if the myocardium is to be restored to activity.

DISCUSSION

Captain Robert B. Brown MC USN. There can be no argument with the statement that administration of adequate amounts of blood by the intra arterial route is effective in treating profound hypovolemic shock. Neither is there any doubt that the current definition of "adequate" in referring to blood replacement has been so upgraded by recent experience in Korea as to be almost unbelievable.

Many different mechanisms have been proposed to explain an apparent superiority of the intra arterial over the intravenous route in the transfusion of patients in profound shock. This is neither the time nor place to enter into the argument as to whether these contentions have ever been supported by conclusive proof that such is true if equal volumes of blood are given in like periods of time by the two routes. The invitation to discuss General Seeley's paper on intra arterial transfusions stimulated an enquiry on my part among some of my colleagues into actual usage of the procedure not only in our own institution but in other naval and civilian hospitals.

The data in table 1 indicate a low ratio of intra arterial transfusion to total number of blood transfusions in the hospitals that replied to my questionnaire.

The sites of administration of the intra arterial transfusions were as follows. The radial artery was used most frequently and usually by the "cut-down" technic. Occasionally the femoral artery was used, percutaneously. The brachial artery was used once and the aorta on occasions when it was exposed.

TABLE 1 *Intra arterial transfusions given in 1953*

Institution	Number of intra-arterial transfusions	Total number of blood transfusions (all types)
1 Civilian Hospital No 1	3	9 000
2 Civilian Hospital No 2	24	4 685
3 Civilian Hospital No 3	5	720
4 U S Naval Hospital No 1	0	—
5 U S Naval Hospital No 2	8	4 141
6 U S Naval Hospital No 3	6	2 879

Units of blood rather than total number of transfusions.

Indications given for choosing the intra arterial over the intra venous route for administering the transfusions were (1) hemorrhagic or traumatic shock not responding to intravenous transfusion (2) blood loss too rapid for intravenous replacement, (3) maintenance of blood pressure during extensive surgical operations on severely injured or exsanguinated patients, (4) profound shock associated with one case each of mesenteric thrombosis and acute pseudomembranous enterocolitis and (5) shock associated with right-sided heart failure and pulmonary edema. One cannot but question the second indication because extremely rapid replacement of blood is possible, if a pressure setup is used on the venous side. In most instances the third objective can be accomplished by prompt and adequate intravenous transfusion. In the patients with extensive mesenteric thrombosis and acute pseudomembranous enterocolitis the blood pressure was elevated in each instance by the intra arterial transfusion but as soon as the latter was discontinued the pressure fell and the patient died. In general intra-arterial transfusions given for the

above-listed indications were successful. Complications were a cyanotic and painful hand in one patient and a fatal case of congestive atelectasis (liver lung) The patient who died as a result of congestive atelectasis did so after receiving about 30 units of blood many of which had been given intravenously, so that the complication cannot rightly be attributed to the intra arterial route alone

Of what significance are these data? It is not implied that these facts on the actual usage of intra arterial transfusion settle the very stimulating controversy centering about the procedure but they do strengthen my own opinions on the subject which may be summarized as follows. Intra arterial transfusion is a very effective means of treating profound hypovolemic shock. The need for intra arterial transfusion however should be and is, infrequent if blood replacement by the intravenous route is prompt and adequate. Intra arterial transfusions are being justified in many instances on the basis of indications which are open to question. Although complications are not commonly encountered when intra-arterial transfusions are given with proper precautions they are too frequent and serious to justify the procedure on any but strong indications such as those set forth by General Seeley

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Research in Science

To plan direct and do good rese rch you *must* frequently think well ahead of existing knowledge. Occasionally it is known to everyone that a great goal has *not* been reached and the literature may be ignored but the individual who follows this path more often attains oblivion than f me. When a real advance has been made it is a relatively short time before the weight of interest and ability of other laboratory groups force the originators to share or relinquish leadership. This is as it should be and there will always be hosts of glittering new problems for those who can never be completely happy unless they are venturing into some phase of the unknown. It is more exciting to tackle a problem and if fortunate to enjoy for even a brief space the thrill of a new trail than to develop well established fields—but the latter course may be m ch more product ve. As long as an investigator can continue to attract young minds and to keep his own open to the myriad opportunities which lie ahead in research there is scope—and hope—for him.

—CHARLES H. BEST, M. D.

A nals f l t rnal M d

p 434 Sept 1953

ACUTE ANTERIOR POLIOMYELITIS IN THE NAVY

SIDNEY A BRITTEN *Commander MC USN*

IN a previous article¹ it was concluded that. (1) there is little likelihood of the spread of clinically apparent poliomyelitis in ships and stations even after the appearance of two cases within five days, (2) it is improbable that large amounts of gamma globulin would be required for prophylactic use, and (3) there is no well established justification for routine inoculation of personnel attending patients, providing communicable disease precautions can be observed To test these conclusions, the incidence of poliomyelitis in all U S Navy ships and stations for the calendar year 1952 was reviewed As in the previous study, the source of the statistical data presented is a tabulation of new cases on the Individual Statistical Report of Patient, NavMed-F

Poliomyelitis outbreaks occurred at only 107 (5.6 percent) of about 1,900 ships and stations submitting morbidity reports during 1952 As in the two preceding years, the occurrence of multiple cases was not the rule Seventy-four percent of the outbreaks consisted of a single recognized case, of which 21 percent were of the nonparalytic type (table 1) Among the activities reporting only one case were nine large air bases, three hospitals, three receiving stations, and one recruit training center This suggests that size of population was not a controlling factor in the development of multiple case outbreaks in 1952 Included in this group also were 25 ships in which, in spite of intimate living and working conditions, circumstances were apparently unfavorable to recurrence of clinically evident infections

The intervals shown in table 2 were chosen because they represent the periods during which passive immunizations are expected to be ineffective, effective, or partially effective in preventing the occurrence of cases, when administered to family contacts or as mass prophylaxis during an epidemic²⁻⁴ If the period of significant protection afforded by 0.14 cc of gamma globulin per pound of body weight is taken to be the second through the fifth week, and if diminishing protection is afforded through the eighth week, then only 17 paralytic cases might have

been prevented or rendered less severe if gamma globulin prophylaxis had been administered to all susceptible contacts following the appearance of one confirmed case at each of 107 activities many of them large and many with intimately intermingled personnel

TABLE 1 *Outbreaks of poliomyelitis according to number of cases paralytic and nonparalytic U S Navy and Marine Corps 1952*

Outbreak		Type of case		
Type	Number	Total	Paralytic	Nonparalytic
Singl e	79	79	62	17
Two cases	14	28	18	10
Three or more cases	14	76	55	21
Total	107	183	135	48

A total of 38 patients with paralytic disease were admitted at eight stations that reported multiple case outbreaks. If gamma globulin had been administered to contacts after the appearance of two cases within a five-day period the total could have been reduced by not more than eight patients.

TABLE 2 *Interval between first and subsequent cases of 28 multiple case outbreaks U S Navy and Marine Corps 1952*

Interval between first and subsequent cases (days)	Number of subsequent cases	
	Paralytic	Nonparalytic
0-6	6	—
7-34	17	7
35-55	—	5
56 or more	26	17

Thirty one percent of all the cases were reported from three rather small circumscribed areas in the United States. These are shown in table 3. Cases were being reported by the civilian health agencies and in general when the incidence was highest in service activities it was also highest in the cities in the vicinity. All except three of the 20 continental Navy and Marine

Corps stations where multiple case outbreaks occurred were located near cities where poliomyelitis was prevalent and recorded.² The failure of confirmed poliomyelitis to occur in multiple case outbreaks in most of the ships and stations suggests the possibility that a significant number of the cases among service personnel originated in sources outside their stations of duty. This becomes a prominent consideration bearing upon use of prophylactic measures.

The 1952 experience appears to indicate that specific prophylactic measures should be applied before the first case is detected on a ship or station, if the incidence of poliomyelitis is to be substantially reduced by such means. In view of the short duration of protection afforded by gamma globulin and the scanty supply, practical considerations limit prophylactic measures to vaccines, which are still in the experimental stage of development.⁴⁻⁶

Table 4 indicates that specific rates for officers were higher than for enlisted men. This is not easily explained by an hypothesis of dissemination of poliomyelitis within a ship or station and suggests a search for family exposure, a project beyond the scope of this study.

Rates among enlisted personnel are uniform except for medical and dental enlisted men. The higher rates for this type of personnel held true in 1950 and 1951. Statistical analyses show that the difference in rates each year could be expected to occur frequently due to chance alone, yet because the difference is consistent through the three year period, the possibility that it may be of some significance remains to be excluded. Besides the exposure to infection that Hospital and Dental Corps personnel have in common with other enlisted persons on and off station, exposure to patients, known or unknown, is likely to be more frequent.

In view of the intimate nursing care that patients with paralytic poliomyelitis require, administration of prophylactic injections of gamma globulin to medical department personnel caring for such patients in hospitals has been proposed frequently. In 1952 only one hospital corpsman was admitted from each of three naval hospitals; the remaining five were admitted from individual ships and stations. Although the association of cases among such personnel with the care of patients cannot be excluded, it would appear that hospital duty was not sufficiently hazardous to produce recognized epidemics among attendants of patients. If all eight cases were to have been prevented, administration of gamma globulin would have had to have been quite general and well beyond limits of practicability. Certainly the administration of this preventive measure only to hospital personnel would not have strong justification.

TABLE 3. Monthly incidence of poliomyelitis in continental and adjacent cities, Navy and Marine Corps Stations, 1952

Area	Month (1952)												
	Total	J	F b	Mar	Ap	May	Jun	July	A g	S pt	Oct	N	D
San Diego-Long Beach-Los Angeles													
Continental	692	14	18	9	8	15	30	33	103	129	133	146	54
Northern	43				2	3	2	2	6	9	5	7	7
Religious District	2					1						1	
Compartment Administration	11							3	2	2	4		
Medical Corps Recruit Depot	3				1		1						1
Naval Training Center	12				1				2	3	3		3
Naval Air Station	8					2	1	1	1	1		1	1
Other with only	7							1		3		1	2
San Francisco-Oakland													
Continental	317	3	3	3	1	5	8	5	28	51	49	114	47
Northern	12	2	1		1		1		1	2	2	1	1
Naval Air Station Alameda	2									1	1		
Naval Air Station Moffett Field	2	1			1								
Other with only	8	1	1				1		1	1	1	1	1

TABLE 3 Monthly incidence of poliomyelitis in selected continental and in adjacent cities Navy and Marine Corps Stations
1952—Continued

Area	Month (1952)												
	Total	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Memphis Tenn.													
Civilian incidence	74			1	1		4	15	12	21	10	8	2
Naval incidence	13							1	12				
Naval Air Station Memphis	4								4				
Naval Air Technical Training Center Memphis	9							1	8				

TABLE 4 Acute anterior poliomyelitis and paralytic
exocytotic type(Specific incidence per 1000 average
U S Navy and Marine Corps 1952)

Type of personnel	Incidence	
	Number	Rate per 1000 average
Total medical staff	32	0.33
Line USN	24	0.25
Line USMC	6	0.35
Medical Corps	1	0.22
Warrent Office Hospital Corps	1	2.99
Total military	150	0.16
Medical dental	8	0.27
All other naval	106	0.15
Marine Corps	36	0.17
Females listed (clinical medical and dental)	1	0.15
Total	183	0.17

SUMMARY AND CONCLUSIONS

A review of new cases of acute anterior poliomyelitis admitted during 1952 appears to indicate that specific prophylactic measures should be applied generally without waiting for confirmed cases on a ship or station if the incidence of paralytic cases is to be materially reduced. This deduction applies to medical and dental personnel as well as to other categories of Navy and Marine Corps personnel.

No justification could be discovered for requiring the passive immunization of contacts subsequent to the detection of single or multiple cases on a ship or station or of medical department personnel following exposure to a patient with the disease.

From the experience in the period 1950-1952 within the limitations of the data reviewed the inference seems plain that a marked reduction in incidence of acute anterior poliomyelitis awaits the development for general use of an actively immunizing material which can be administered prior to exposure or of some other prophylactic measure not as yet proposed.

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Modern Preparation of Dental Cavities

The introduction of high speeds diamond instruments of special design and carbide burs into restorative procedures has provided a more efficient method for the rapid removal of hard tooth enamel. Through the application of carefully worked out techniques and procedures, efficiency in cavity preparation may be increased while the time factor is reduced. A combination of high speeds, light pressures, and the continuous use of coolants greatly reduces trauma incident to operative procedures. These are important factors in relieving nervous tension for both the patient and the operator. In the final analysis, success in the clinical application of modern instruments and increased operating speeds is dependent on the operator's knowledge of the many physiological and mechanical principles involved and on his mastery of special techniques and procedures which to some degree change the present concepts of procedures in cavity preparation.

—REX INGRAHAM D D S and
H M TAYLOR D D S

in *Journal of the American Dental Association* p 323 Sept 1953

Air Force Surgeon General Receives Chilean Decoration



*Ambassador Anibal Jara of Chile left and Major General Harry G. Armstrong
USAF (MC)*

Major General Harry G. Armstrong, Surgeon General of the U. S. Air Force, recently received the *Medalla Militar de Segunda Clase de la Fuerza Aerea de Chile* from Ambassador Anibal Jara of Chile in a ceremony at the Chilean Embassy in Washington. The gold medal of the Chilean Air Force, which had not previously been given to a United States military medical officer, was awarded to General Armstrong for his valuable services to the Chilean Air Force and to all humanity, as the author of *Principles and Practice of Aviation Medicine* and for his assistance in providing training to Chilean students at the U. S. Air Force School of Aviation Medicine.

The ceremony was witnessed by Major General Raul Yazigi, Surgeon General of the Chilean Air Force, and Brigadier General Jorge A. Castro, Surgeon General of the Chilean Army, who were attending a medical meeting in Washington.

AIR EMBOLISM AS A RESULT OF SUBMARINE ESCAPE TRAINING

JACOB L. KINNEY, Chairman, NC USN

A If embolism has been the most typical cause of the edema at the submarine surface diving tank at this early stage. The air enters the pulmonary circulation through alveolar capillaries ruptured by over-inflation of the lungs caused by a passive intrapulmonary air pressure. Decompression sickness (caisson disease, bends, or staggers) is a result of the reduction of ambient pressure liberates nitrogen from solution and that bubbles form in both tissues and blood. Each bubble, if intravascular, occludes totally or partly the vessel to air embolism, but the term, "a r embolism," is in agreement received in movement in the vascular system of bubbles of air or gas introduced into the veins or arteries.

It has been noted that the air embolism casualties occurring at the escape training tank (figs 1 and 2) have rather definite patterns. The cases reported below illustrate three types that differ in speed of onset, severity, and localization of symptoms, and presumably in other but relatively obscure ways.

CASE REPORTS

Case 1 This man was undergoing advanced training in submarine escape, known as "free escape training," as well as in the use of the aqua lung. In free escape training the man submerges the water from locks at varying depths, he swims down with an aqua lung, "ditches it," and allows himself to float to the surface, exhaling the expanding air from within his lungs at a uniform rate which is determined by his degree of buoyancy. He must breathe out or exhale enough air to vent off the increasing pressure within his lungs, but at the same time must not vent off so much air that he becomes "negatively buoyant" and sinks in the water. In such a training exercise as this, an instructor who is highly trained in this technique of escape accompanies the man in his ascent to check on him at all times and controls the rate of exhalation through a series of signals such as tapping on the chest or on the hip.

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London Conn

The man complained about fullness in his neck sore throat on the outside" which was noticed a few minutes after completing a



Figure 1 Sigsbee Tower, U.S. Naval Submarine Base, Groton, Conn.

50-foot free ascent from the 50-foot lock to the surface. Prior to this the man had descended to 100 feet with an aqua lung and "ditched" the lung and attempted to make a free ascent. He stated

that he did not have enough air to get to the surface and was taken into the 50 foot lock. The instructor accompanying him said that he ascended about 10 feet without expelling air. The instruc

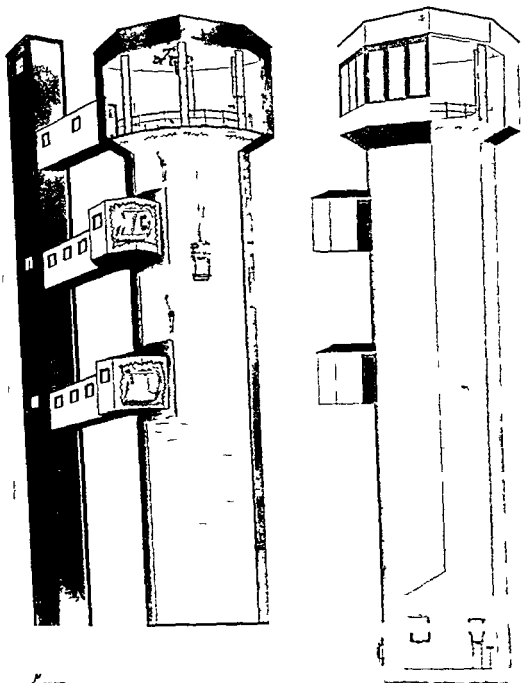


Figure 2 Cutaway illustration of the submarine escape training tank.

tor signaled him, by tapping his chest, to breathe out, which he did. He then started up again without expelling air and the instructor again signaled him and he responded with a "burp" of air. After a third time, the man signaled he was out of air and was

taken into the 50 foot lock. The free ascent from 50 feet to the surface was uneventful. While dressing somewhat later, his voice began to change to a noticeably nasal quality. Because this increased, he reported to the medical officer.

He also complained of a pulling sensation in the midline of the chest and a fullness in the throat. Some subcutaneous emphysema was present in the supraclavicular area and neck. The voice had a brassy, flat quality. Loud musical rales were present anteriorly near the midline of the chest. A crackling sound was present with the second heart sound along the midline of the chest. He was taken to the infirmary via ambulance and anteroposterior and left and right lateral roentgenograms of the chest taken. He was returned to the escape training tank via ambulance for recompression.

The man was recompressed. At a depth of 35 feet the subcutaneous emphysema had disappeared. Subjective symptoms in the chest and throat remained unchanged at 100 feet. At this depth the rales and heart "crackle" had disappeared. He was further compressed to 165 feet at which point definite subjective improvement in the chest pain was present. The throat fullness had changed to a soreness. Physical examination of the chest was negative. The patient was placed on treatment table No. 3, which consists of 30 to 120 minutes at the equivalent air pressure of 165 feet followed by 12 minutes at each depth of 140, 120, 100, and 80 feet. 30 minutes at each depth of 60, 50 and 40 feet employing oxygen or air breathing. 12 hours at 30 feet and 2 hours each at 20 and 10 feet. The only finding at this time was unequal pupils. At the 30-foot stop there was no change subjectively, but he complained of external anterior neck soreness which was worse on swallowing or when he opened his mouth wide. Dryness of his throat, and general fatigue. There was no chest pain, dizziness, nausea or headache, and no paraesthesias or numbness.

Physical examination revealed all cranial nerves to be normal reflexes, physiologic. There was subcutaneous crepitus bilaterally over the anterior neck and this had decreased in extent since first being noted. Mediastinal crackle was heard only on forcible exhalation in the stooped position, over the precordium. There were no abnormal heart or lung findings.

After recompression there were minimal complaints upon surfacing, mainly slight soreness in the neck muscles. There was slight inequality of pupils, left larger than right. Subcutaneous crepitus, right side of neck. No abnormal chest findings. He was transferred to the infirmary for further observation. Roentgenograms revealed presence of air in the planes of cleavage in both the mediastinum and cervical areas (fig. 3).

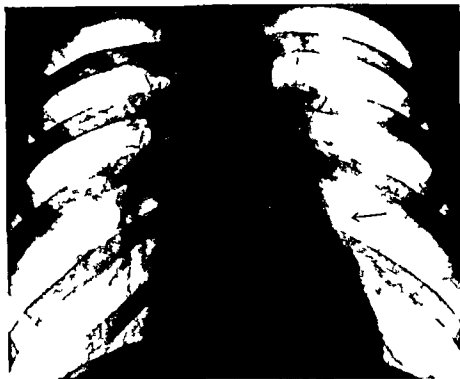


Figure 3 (case 1) Lateral roentgenogram showing mediastinal emphysema

Case 2 This man was undergoing repeat training for the third occasion in the use of the submarine escape appliance, also known as the "Momsen lung." When he was making the 100-foot escape the instructor noted that he was not making a proper escape at about 22 feet from the surface. The appliance was fully distended and a large bubble of air escaped from his mouth. Although given the signal to "breathe deeper into the appliance" it remained fully distended and then he was allowed to ascend about three feet up the line. With the appliance distended and bubbles streaming from the flutter valve it was evident that the man was not breathing into the appliance.

The man was removed from the line into the 18 foot lock. He was examined by the duty tank medical officer in the lock. The patient stated that he was "dizzy, and left hand feels funny." He

stated that the appliance functioned well after it was charged with oxygen prior to leaving the 100-foot lock. However, after he started his ascent, he felt all right but stated that "it seemed as though I couldn't breathe into the appliance at all but I did let bubbles of air out of my mouth." He was taken to the surface in the roving bell which, as can be seen in the cutaway of the submarine escape training tank (fig. 2), allows a man to be surfaced from any depth from 80 feet upward with head and shoulders in an air pocket.



Figur 4 (ca 2) A terop sterior roe ig nogram showi g pr nce of ai
the m dia t m.

Physical examination during the two-minute elevator trip to the ground level revealed that he was coherent and co-operative with complaint of numbness all over my left forearm losing my left grip. The left-hand grip was very weak as compared with his right. En route from the elevator to the recompression chamber his general condition underwent rapid deterioration. Although conscious he stumbled and in falling cried "My legs feel weak."

He was given immediate recompression. At 60 feet he noted that strength was returning in his left hand and that the numbness was decreasing. At 80 feet most of the numbness had subsided. At 160 feet he felt "fine." The general physical and neurologic examination was negative at this depth.

This man was also treated on table No 3 For the first 24 hours following treatment a definite crackling sound was heard on auscultation alongside the lower sternum during complete expiration The heart beat accentuated this crackle

Roentgenograms of the chest showed air in the mediastinum (figs 4 and 5) The physical and roentgenographic findings of mediastinal emphysema had disappeared by the third day and the patient was discharged to duty



Figure 5 (case 2) Roentgenogram late al position, showing mediastinal emphysema

Case 3 This man left the 50 foot lock and appeared to be in no difficulty Bubbles were seen issuing from his mouth When he reached the 20-foot level he was being accompanied by an instructor so the view glass (a transparent-bottomed, plastic box through which one of the officers observes the training procedure) was switched to view the next man as he left the 50 foot lock

When next observed, this patient was thrashing around in the water on the surface, apparently in a convulsion At this time a considerable quantity of frothy, red fluid issued from his mouth

He was carried to the elevator and on the way down he gave two or three convulsive gasps. Artificial respiration was attempted during this time, but his chest was rigid. At no time was he conscious nor did he make any purposeful movements. No radial, temporal or carotid pulse was obtainable. There was very minimal cyanosis. He was removed from the elevator and carried to the recompression chamber in the research annex of the tank buildings. Pressure was started and about one minute later his muscles relaxed for the first time, his eyeballs rolled upward and his pupils became fixed. No pulse was obtainable at this time and cyanosis remained minimal. Artificial respiration was continued, with a good exchange of air as the pressure in the chamber was built up. The radial and temporal pulses were checked at intervals, but no pulse beat could be detected.

Pressure in the chamber was built up to 73.4 lb per square inch (equivalent to 165 feet of water). At this time 1 cc of epinephrine solution, 1:1000, was injected into the left median basilic vein. A minute later a similar dose was injected directly into the apex of the heart.

Artificial respiration and the administration of oxygen by mask were continued for about 11 minutes, when examination revealed no response to strong skin stimulus and no muscle movements of any kind. The eyeballs were rolled upward, the pupils dilated and fixed and there was no response to strong light stimulus directed into the pupils. No respiratory or cardiac sounds could be detected by auscultation. At this time treatment was discontinued and the occupants of the chamber were decompressed according to the standard decompression table for 170 feet and 40 minutes.

It was the impression of the attending medical officer that he died shortly after being placed in the recompression chamber. The clinical impression was that the cause of death was acute air embolism with cerebral anoxia and cardiac insufficiency secondary to the introduction of considerable quantities of air into the pulmonary blood stream.

Following is a summary of the significant findings at autopsy. Upon removing dura mater the pia mater was found to be clear and all of the underlying cortical blood vessels were seen to contain widely dispersed air bubbles. Some vessels contained so much air that nearly all of the blood was forced out, leaving a 2 to 3-cm. expanse of blood vessel free of blood. There was hardly a cortical vessel that did not contain at least a few air bubbles.

The visceral pleura was for the most part smooth, thin and shiny; however, there were about 10 small areas of superficial bleb formation. They were filled with air and were elevated about 1 or 1.5 mm. from the surface of the lung. These blebs were

found on all surfaces of the lungs with the exception of the apical region. The pericardial sac was obliterated by rather fine, dense adhesions between the pericardium and the epicardium. This obliteration seemed to be old and was complete.

There was marked dilation of the right auricle and atrium of the heart. The left auricle and atrium were also dilated moderately. The pericardial sac, as mentioned, was opened only with separation of the fine, threadlike adhesions. Upon opening the heart under water, air was found in the left atrium and ventricle. The blood was somewhat frothy in these chambers. The free margin of the mitral valve was thickened, with some rolling. The papillary muscles were markedly enlarged and hypertrophied. The coronary arteries were patent throughout their entire length and showed only minimal atherosclerosis. No entrapped air was discovered in the coronary arteries.

The external surfaces of the lungs were smooth and shiny and exhibited the previously mentioned superficial bleb formation. The cut surface was pinkish purple, with an accentuated crepitant sensation to passage of the knife blade. There were no visually apparent areas of atelectasis or emphysema, however, it seemed, from the marked expansion of the lungs while still in the chest, with overlapping in the midline and increased crepitation, that there was a generalized emphysema. A thin, frothy, pink fluid could be expressed in minimal amount from the cut surface. Numerous veins that were opened contained foamy blood, due to entrapped air bubbles.

Case 4 This man was undergoing advanced training in submarine escape. He previously had completed escapes with the submarine escape appliance from 18 feet, 50 feet, and 100 feet, respectively. Following that, he had made three successful free escapes from the 18 foot lock and was making a first escape from the 50 foot lock when the accident occurred. He made an apparently normal escape and bubbles were seen to be issuing from his mouth by his accompanying instructors. He reached the surface of the water and the first inkling that the instructors had of the accident was when the man reached for the ladder to climb from the water and fell back into the water. He was quickly removed from the water and found to be comatose and in a rigid tonic convulsion. During the time he was being removed from the training platform, placed in the elevator, and taken down to the lower level he breathed in a stertorous fashion but soon ceased to breathe entirely. No palpable pulse could be detected during this time. He was immediately placed in a recompression chamber and pressure was started. Artificial respiration was attempted and 1 cc of 1:1000 epinephrine solution was injected into the cardiac area. At no time could a pulse be detected, nor were any voluntary

respiratory movements initiated. The duty doctor, who had accompanied the patient from the time he was removed from the water until he was pronounced dead, considered that the patient died either in the descent in the elevator or shortly after being placed in the recompression chamber. Pressure was stopped when that equivalent to a depth of 70 feet had been reached. All attempts at treatment were discontinued at that time.

At autopsy there was obvious crepitant subcutaneous emphysema extending along the neck on both sides from the sternal notch to the mastoid prominences on both sides. In the cranial cavity, the superficial cortical blood vessels contained large numbers of air bubbles, but were not obviously distended.

Examination of the organs of the thoracic cavity in situ revealed extensive, crepitant, mediastinal emphysema involving primarily the fatty tissues of the mediastinum and extending up the neck as far as the incision was carried. The heart was very markedly dilated with air, actually being puffed out like a balloon. Palpation of the heart indicated that it contained little or no blood. The principal dilatation appeared to be that of the right auricle and ventricle, but both the right and left auricles and ventricles were dilated with air. The visceral pleura was smooth and glistening and showed no adhesions, but exhibited several subpleural blebs of varying sizes. These ranged from about 0.5 to 3.0 cm. in diameter and were filled with air. All major vessels encountered were ligated before being severed in order to prevent air from leaking out. Each ligated vessel was opened under water, and it was observed that bubbles of air, along with blood, issued from most of the large vessels opened. The largest amounts of air were expressed from the aorta and superior vena cava.

There was marked dilatation of both right and left auricles and atria of the heart. Both of the ventricles contained a large amount of air and a small amount of blood. This blood was dark red and was not frothy. Examination of the intraventricular septum revealed no obvious patency or rupture. The coronary arteries contained numerous bubbles of air, there being more air than blood in these vessels. There were no obvious areas of myocardial infarction.

Both lungs appeared to be uniformly crepitant and emphysematous. As noted above, superficial blebs were seen on the external surfaces of both lungs. Bubbles of air could be expressed from the pulmonary vessels, but these vessels did not appear to be distended with air. Repeated sectioning of the lungs and hilar areas failed to reveal any gross structural changes or evidences of rupture.

DISCUSSION

The clinical picture in case 1 was that of rather mild, local symptoms coming on relatively slowly. In case 2, the symptoms were moderately severe, came on rapidly, responded well to recompression therapy but showed residuals similar to case 1 (substernal pain, crackling, roentgenographic findings). Cases 3 and 4 presented extremely severe symptoms with death occurring prior to or shortly after entering the recompression chamber. The need for haste and the noise of the air entering the chamber during recompression preclude a careful, complete physical examination, as getting the casualties under pressure is of paramount importance.

It is the writer's belief that the severity of symptoms and the rapidity of onset is related to two main factors: (1) the amount of air entering the vessels or tissues, and (2) the tissues and pathways involved in the trauma. In further considering item (1), this is determined by the depth at which the injury occurred, the speed of ascent, and the amount of air expelled through the usual respiratory passage during the ascent. Item (2) presents a more complex situation, with little concrete information as to the pathways of the air in the interstitial tissues. In case 1, it can readily be deduced that an interstitial emphysema resulted from tearing of the alveoli and air entering the mediastinum by following the course of the large pulmonary blood vessels, then following the fascial planes into the neck. The relatively slow onset of symptoms may be due to resistance to the spread of air by the tissues encountered. This case does not represent true air embolism, as the symptoms are primarily due to air in the interstitial tissues, but it may represent an intermediate step in the development of true air embolism.

In case 2, it must be assumed that air was introduced into the vascular system in small amounts. This could occur by air entering small interstitial veins, being carried to the left ventricle and then producing arterial air emboli, the most serious of which would be in the coronary or cerebral vessels. The symptoms in case 2 indicate that the primary area affected was the right cerebral hemisphere anterior and posterior to the Rolandic fissure. It is theorized that the amount of air entering the vascular system is limited by the small diameter of the blood vessels involved, the remainder of the air follows the pathways noted in case 1. The more rapid transport of the air in the vascular system produces the cerebral symptoms quickly and this along with the greater severity masks those effects caused by air in fascial planes. The latter symptoms are noted in most instances after decompression has been completed.

It is apparent that in cases 3 and 4 vastly greater amounts of air gained entry to the vascular system and interstitial tissues. It can be seen from the gross autopsy reports that both men suffered acute pulmonary emphysema (bleb formation) as well as mediastinal and subcutaneous emphysema of marked degree. The most significant postmortem finding in this author's opinion and probably the chief cause of death in both cases was the dilatation of the cardiac chambers with air. It is believed that the "old rheumatic endocarditis" with valvular lesion was not a factor in case 3 as there were no signs of decompensation and no subjective symptomatology present before the accident. Air in the cerebral vessels was probably of secondary importance because although the amount found would eventually cause serious neurologic complications or death the victim either expired or was moribund from the anoxia resulting from the air trapped in the heart. The mode of entry of the air was not discovered in either of these patients; however the presence in both of air in the left auricle and ventricle indicates that the path was through the pulmonary veins. In case 4 the distention with air of the right auricle and ventricle suggests an additional less direct path. It seems unlikely that the air would travel in retrograde fashion through the pulmonary arterial system even if entry into these thicker walled vessels were gained. Wolfe and Robertson in 1935 indicated that air introduced intravenously did not go against the blood stream in spite of variation in gravity. A more plausible route would be through the pulmonary lymphatic vessels to the large veins of the neck and thence to the right heart. The pressure of air in the right heart presents a problem similar to that found in previously reported surgical cases. Martland in 1945 discussing air embolism as a complication of surgery points out that a relatively large volume of air reaching the right auricle results in a cardiac tampon of foamed blood.

In dealing with this situation Durant and associates suggested placing the patient in the left lateral position to displace the air trap in the right ventricle. Hamby and Terry⁴ and Musgrove and MacQuigg⁷ reported use of this maneuver in successfully treating cases of air embolism with air in the right side of the heart. If however air should be present in both chambers, the maneuver would probably be of doubtful value. In this instance the head should be placed at a lower level than the rest of the body to minimize the possibility of air entering the cerebral circulation. While it is of course mandatory that recompression be accomplished as rapidly as possible in cases of air embolism resulting from reduction of ambient pressure it may be that placing the casualty in the left lateral position with head lowered while being transported to the recompression chamber and during the recompression procedure will prove to be a method whereby lives may be saved.

SUMMARY

Air embolism may result from accidental introduction of air into the vascular system during submarine escape training. In four patients reported, two of whom died, the speed of onset and severity of symptoms were of three different types. In treatment a simple maneuver has been suggested as a possible means of preventing death in cases where only the right heart is involved. Immediate recompression is essential in air embolism occurring in decompression.

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Transverse Abdominal Incisions

A recent survey of over 500 certified surgeons in this country revealed that only about 26 percent are employing transverse or muscle-splitting abdominal incisions for the common types of abdominal operations. It appears therefore that the majority of surgeons and most of the other physicians performing surgery are using midline or paramedian incisions. It seems inconceivable that adherence to these standard incisions by so many still exists in view of the many unfavorable reports concerning the significantly high incidence of wound dehiscence and herniation which follows these incisions. These complications have been reported to occur in from 2 to 10 percent of abdominal operations in which the midline or paramedian vertical incisions were employed, whereas the reports of many surgeons using a muscle splitting or transverse incision indicate that these two complications are rare occurring in less than 1 percent of all cases.

—LOUIS T. PALUMBO, M.D. and
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in *A. M. A. Archives of Surgery* p. 514, Oct. 1953.

ROENTGENOGRAPHICALLY DEMONSTRABLE APPENDICEAL CALCULI

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JOHN J SCHWAB *Captain, MC USA*

FECALITHS may be found in as high as 67 percent of patients with appendicitis¹. They are rarely diagnosed by roentgenographic examination for two reasons (1) Preoperative roentgenograms of the abdomen of a patient with well defined acute appendicitis are not usually taken and (2) most fecaliths are not radiopaque. Felson and Bernhard believed that any patient having an appendiceal calculus will probably develop acute appendicitis and they emphasized the importance of early demonstration of such calculus in any patient presenting a diagnostic problem. When a calculus is found it should be treated as a surgical emergency because perforation of the appendix occurs in from 37 to 59 percent of such patients².

Radiopaque appendiceal calculi have been reported to contain calcium magnesium phosphates and carbonates with cellular debris and bacteria³. Ingestion of mercury has also been shown to produce demonstrable calculi in the appendix causing appendicitis.

This is a report of a patient with acute appendicitis due to roentgenographically demonstrable calculi of bismuth.

CASE REPORT

A 30-year old woman was admitted to the hospital 2 January 1953 complaining of intermittent pain in the abdomen and vomiting for three days. The pain was colicky and generalized but more pronounced in the right lower abdominal quadrant. She had had no bowel movements for three days prior to the onset of the present illness. She had been treated by one of us for acute diarrhea with bismuth and paregoric three weeks previously in the outpatient clinic.

From U. S. Army H. I. 8168th Army U. APO 503 S. F. nc c. Cal f.



Figure 1 Anteroposterior roentgenogram of the abdomen showing fecaliths coated with radiopaque substance

The physical findings were temperature 99.6° F, pulse, 84 and slight distension of the abdomen with diffuse tenderness more marked in the right lower quadrant. The white blood cell count was 13,250 with 73 polymorphonucleocytes. A roentgenogram of the abdomen showed radiopaque fecaliths in the right lower quadrant (fig. 1). An acutely inflamed appendix containing

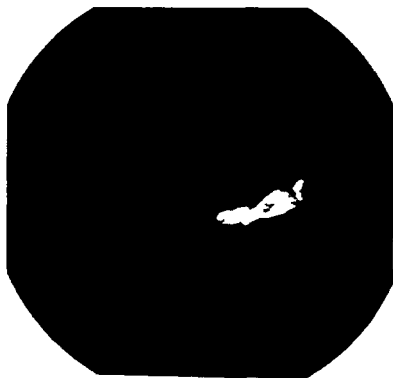


Figure 2. Specimen after appendectomy. Chemical analysis proved opaque material to be bismuth

ROENTGENOGRAPHICALLY DEMONSTRABLE APPENDICEAL CALCULI

PHILIP E GEDEON *Capt n, MC USA*

JOHN J SCHWAB *Capt n, MC USA*

FECALITHS may be found in as high as 67 percent of patients with appendicitis¹. They are rarely diagnosed by roentgenographic examination for two reasons (1) Preoperative roentgenograms of the abdomen of a patient with well defined acute appendicitis are not usually taken and (2) most fecaliths are not radiopaque. Felson and Lennhard² believed that any patient having an appendiceal calculus will probably develop acute appendicitis and they emphasized the importance of early demonstration of such calculus in any patient presenting a diagnostic problem. When a calculus is found it should be treated as a surgical emergency because perforation of the appendix occurs in from 37 to 59 percent of such patients³.

Radiopaque appendiceal calculi have been reported to contain calcium magnesium phosphates and carbonates with cellular debris and bacteria⁴. Ingestion of mercury has also been shown to produce demonstrable calculi in the appendix causing appendicitis.

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CASE REPORT

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From U S Army Hospital 8168th Army U APO 503 S Ft Mc Call

PHENYLBUTAZONE TOXICITY

Report of Two Cases

IRVIN M BECKER *Lieutenant, junior grade MC USNR*

MARTIN C SHEA *Lieutenant junior grade MC USNR*

SINCE the introduction of phenylbutazone (butazolidin) into this country by Kuzell and others¹ numerous reports of the toxic features of the drug have appeared in the literature. Most significant of these have been agranulocytosis²⁻⁵ with death in two cases,^{6, 7} activation of peptic ulcer disease,⁸ hemorrhage from peptic ulcer,⁹⁻¹⁰ precipitation of peptic ulcer,¹¹ and perforation of peptic ulcer.¹² Additional features mentioned have included rash, edema, nausea, vomiting, vertigo, anemia, diarrhea, dyspnea, epistaxis, stomatitis, thrombocytopenia, hematuria, liver dysfunction, chills, and fever.^{1, 3, 9, 11, 13}

We have recently had the opportunity to follow two patients who developed complications while being treated with phenylbutazone.

CASE REPORTS

Case 1 This 56 year old man was admitted to the hospital on 25 May 1953 with the chief complaint of malaise of one week's duration. One week prior to the onset of symptoms the patient was placed on 600 mg of phenylbutazone daily by his family physician for generalized degenerative joint disease. After one week of this therapy, during which time the arthritic symptoms disappeared the patient developed a severe chill followed by symptoms of generalized weakness, abdominal cramps, headaches and anorexia. Severe chills occurred twice daily, usually in the morning and evening, lasting about 30 minutes, and followed by fever and perspiration with temperature elevation to about 103° F. For three days prior to admission the patient had dark reddish brown stools with occasional streaks of bright red blood. His appetite had been poor and there was a weight loss of 14 pounds during the week preceding admission. He complained of generalized soreness and cramping in both lower abdominal quadrants and in the right upper quadrant. No change in bowel function was noted.

From U. S. Naval Hospital, Oakland, Calif.

There were also symptoms of slight frontal headaches with dizziness. He experienced mild fainting like episodes two to three times daily associated with numbness in the fingers, arms and legs following ingestion of the drug. In association with the chills and fever the patient observed some cardiac palpitations with occasional skipping of beats and progressive exertional dyspnea. A slight cough with small amount of sputum and soreness across the anterior chest were also noted.

The patient had had a gastric resection in July 1952 for a benign gastric ulcer of the lesser curvature which had failed to heal under medical management. His only complaint at that time was mild epigastric distress of short duration.

He was well developed, fairly well nourished but appeared to be in acute distress. Temperature was 103.2 F, pulse 100, respirations 18 and blood pressure 110/64. The skin was pale, dry, hot and inelastic. The fundi showed grade I retinopathy. A few moist rales were heard at the left lung base posteriorly and in the left axilla. The heart was normal except for an occasional premature contraction. The abdomen was soft. There was a scar in the midline above the umbilicus from the previous gastric surgery. There was tenderness in the left lower, right lower and right upper abdominal quadrants. The bowel was palpable in the right and left lower quadrants and appeared to be spastic. There was generalized resistance in the right upper quadrant, no definite liver edge was palpated. The tendon reflexes were equal but slightly hyperactive. On rectal examination, reddish brown stool was obtained which was 4 plus for occult blood with (regerson mixture).

Laboratory findings on admission were a leucocyte count of 18,000 with 15 percent nonsegmented neutrophils, 68 percent segmented neutrophils, 15 percent lymphocytes, 2 percent monocytes, erythrocyte count 4,120,000, hemoglobin 11.5 grams, platelets 180,000, sedimentation rate (Wintrobe method) 35 mm, hematocrit 39 VPC, thymol turbidity 9.7 units, alkaline phosphatase 11.5 Bodansky units, blood urea nitrogen 17.3 mg per 100 cc, fasting blood glucose 125 mg per 100 cc, prothrombin time 14 seconds or 100 percent, total proteins 5.9 grams per 100 cc, with albumin 2.3 grams and globulin 3.6 grams and serum bilirubin 0.88 mg per 100 cc. The sulfobromophthalein retention on 27 May was 22 percent at 45 minutes with a dosage of 5 mg per kg of body weight. Occult blood in stool 4 plus, blood smear negative for malarial parasites, urine analysis (catheterized specimen) and culture negative, stool for ova, parasites and culture negative, sputum culture *Diplococcus pneumoniae*, culture of throat smear positive for beta hemolytic micrococcus but the species was undetermined. A routine

roentgenogram of the chest on admission was negative. Gastric analysis revealed 27 units of free acid with a total of 40 units at the end of 45 minutes.

On admission the patient was placed on a strict ulcer type program and supportive parenteral fluids. The generalized abdominal cramping, with tenderness to palpation in the left lower quadrant, persisted. Stools returned to normal color on the second day. The temperature curve revealed elevations as high as 103.6° F occurring irregularly once or twice daily (fig. 1). Blood cultures were taken with each elevation and were found to be positive for nonhemolytic, coagulase negative for *Micrococcus pyogenes* variety undetermined, on four occasions. The difficulty with which this organism was grown and the fact that it was isolated from four separate cultures make it appear significant.

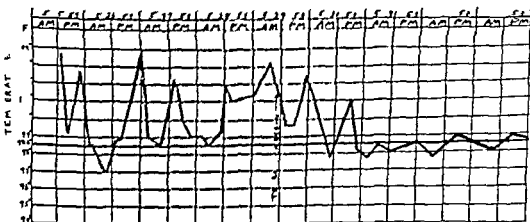


Figure 1 (case 1) Temperature curve showing effect of treatment with oxytetracycline (terramycin)

rather than a contaminant. Febrile agglutinations for typhoid, paratyphoid, *Proteus* OX19, and brucella, taken on 27 May, were negative. Viral studies consisting of complement fixation for Q fever, psittacosis, lymphogranuloma venereum group influenza (A and B), and cold hemagglutinins, taken on 29 May were negative. On this date, after five days without clinical change the patient was started on 750 mg of oxytetracycline (terramycin), given orally every six hours for four doses and then 500 mg every six hours. Within 24 hours after the oxytetracycline was begun, the temperature began to fall with elevations to 101° and 102° F until 31 May, when it returned to normal and remained there (fig. 1). The patient continued to have generalized abdominal cramp and discomfort for several days after his temperature became normal, and then became asymptomatic. On 8 June, febrile agglutinations and viral studies were again negative, and tuberculin, coccidioidin, and histoplasmin skin tests were also negative.

On 10 June a barium enema revealed numerous diverticula in the ascending and descending colon and upper gastrointestinal series showed a normal functioning Billroth I type of gastric resection with no evidence of marginal ulceration. By 16 June all laboratory studies had returned to normal and the patient was discharged asymptomatic except for mild arthritic complaints.

Comments Following one week of phenylbutazone therapy this patient was admitted with symptoms of gastrointestinal involvement bacteremia and transient liver damage. It is believed that the clinical findings presented by this patient were directly related to phenylbutazone.

Case 2 This 39 year old man was admitted to the hospital on 17 April 1953 with the chief complaint of colicky pain in the right side of the back of three months duration. The attacks came at intervals of about every four weeks. Two days prior to admission the patient noted that his abdomen was distended and he had an episode of vomiting. One hour later there was an onset of knifelike pain in the right flank and extending down the right anterior abdomen. With this he observed bleeding on urination but the next morning the bleeding had subsided.

In 1949 a diagnosis of rheumatoid spondylitis involving the spine and hips had been made. The patient also gave a history of gassy crampy pains with much belching and flatus of three years duration. He stated that the discomfort was always worse while he was on aspirin therapy for the arthritis. According to the patient a roentgenogram of the gastrointestinal tract taken six months prior to admission at this hospital was negative. In January 1953 the patient was placed on phenylbutazone therapy for rheumatoid spondylitis. He took 200 mg four times a day for about two weeks. Then he took 600 mg daily. This dose was gradually decreased until two weeks prior to admission to the hospital during which time only 200 mg daily were taken. The last tablet was taken the night before admission. From the beginning of therapy the patient stated that his abdominal complaints became more marked and he developed definite epigastric pain which occurred about three to four times daily. Associated with this abdominal pain was a high posterior back pain. The patient had occasional night pain but had noted no bleeding.

At the time of admission the temperature pulse respiration and blood pressure were normal. The patient was well developed somewhat undernourished and appeared to be in acute distress. The outstanding positive findings were markedly diminished motion of the entire back and tenderness to deep palpation over the right flank and the epigastrium.

Complete blood cell count, sedimentation rate, urinalysis, blood serology, and roentgenograms of the chest were normal. The blood urea nitrogen was slightly elevated to 25 mg per 100 cc. An intravenous pyelogram revealed a filling defect of the upper pole of the right kidney with distortion of the calyces apparently caused by a medially placed mass. Roentgenograms of the spine showed evidence of rheumatoid spondylitis. A nephrectomy was performed on 23 April and a large mass was found at the upper pole of the right kidney. The pathologic report was that of multiple cysts of the right kidney and renal adenoma, probably clear cell carcinoma.

The patient's postoperative course was completely uneventful until the twelfth postoperative day when he suddenly vomited "coffee ground" material and two hours later had a grossly tarry stool. He was given 1,500 cc of blood during the next 12 hours and the bleeding subsided. The following morning he developed a distended abdomen and a flat roentgenogram revealed a markedly dilated stomach. He was placed on Wangenstein suction. His fluids were carefully followed, and daily chemistries were within normal limits. On 2 May the Levine tube was clamped for four hours and only a small amount of residual material was obtained. At this time he was transferred to the medical service and the Levine tube was removed. He was placed on skimmed milk, 5 ounces every hour on the hour, and 1 ounce every hour on the half hour. He was aspirated twice daily, at 0700 and 2200, for gastric retention. The patient's aspirations revealed approximately 250 to 300 cc retention in the mornings and as much as 1,000 cc retention in the evenings. A review of the bleeding factors at this time revealed normal bleeding time, clotting time, prothrombin time, and platelets. The sulfobromophthalein retention was 13 percent at 45 minutes with a dosage of 5 mg per kg of body weight. The stools were negative for occult blood. Electrolytes were followed every few days. Roentgenograms of the upper gastrointestinal tract on 13 May revealed a rather marked gastric distention with delayed emptying. In addition, the roentgenograms showed a constant collection of barium measuring 8 mm in diameter in the region of the pyloroduodenal segment (fig 2). The bulb itself was markedly deformed and spastic. A roentgenogram taken 90 minutes after the barium meal showed approximately 50 percent retention of the barium. Because the patient showed persistent obstruction on a strict ulcer type of program, a subtotal gastric resection was performed on 28 May. The stomach was moderately enlarged and the area of the pyloric sphincter and proximal centimeter of duodenum was indurated and scarred. The pathologic specimen showed the ulcer to be located at the junction of the gastric and duodenal mucous membranes.

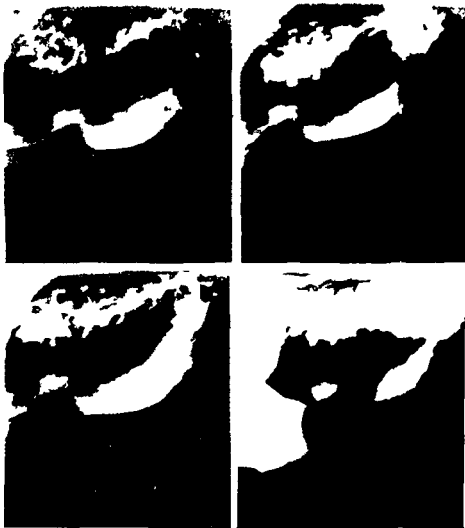


Figure 2 (case 2) Four postoperative rograms of large pyloroduodenal ulcer

Comments This patient had epigastric distress of three years' duration with a negative gastrointestinal series 6 months prior to admission to the hospital. There was a definite change in the character of his symptoms from the beginning of phenylbutazone therapy, and a definite ulcer type of rhythm was established. It seems apparent that the patient had an ulcer at the time of his admission to the hospital but the clinical features were overlooked in view of his presenting complaint of flank pain and hematuria.

SUMMARY

Two patients at this hospital developed complications while being treated with phenylbutazone. In case 1, the bizarre clinical

picture characterized by the unusual temperature curve is of general interest. Case 2 is believed to be the first of obstruction of a peptic ulcer related to phenylbutazone therapy.

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Music and Anesthesia

The salutary effect of music on the emotionally disturbed is not so surprising as its synergistic action in anesthesia. There are several reports claiming that the use of music has sharply reduced the need for preinduction medication. When the administration of music is continued into the stage of anesthesia it has been possible to secure satisfactory narcosis in dental patients with much lower concentrations of nitrous oxide. Although it is justifiable to suspend final judgment on these enthusiastic reports until we can obtain further confirmation, continued experimentation should be encouraged. Certainly the dangers are almost nil. Side reactions and toxic effects are said to be rare except for some mild nausea produced by Ravel's Bolero.

—MAURICE H. FRIEDMAN, M.D.

in *Medical Annals of the District of Columbia*, p. 423 Aug 1953

CYSTIC ADULT TERATOMA OF THE TESTIS ASSOCIATED WITH FAILURE OF THE UROGENITAL UNION

ANTHONY A BORSKI *Capt MC USA*
JAMES C KIMBROUGH *C Ion 1 MC USA (Ret.)*

THE occurrence of benign testicular tumors is rare. Lewis found only six relatively benign teratomas in a series of 250 malignant tumors of the testis. Cook and Kimbrough¹ reported 80 tumors of the testis of which only three were benign. They also noted two cases of epidermoid cyst and one of adult teratoma. Prior to their series only five epidermoid cysts of the testis were reported.

Epidermoid or inclusion cysts contain ectodermal elements without evidence of endoderm or mesoderm. Adult teratoma may show undermal tissue only or they may contain tissues developed from all three germ layers. Overgrowth of one element may be prominent. Adult teratoma is a relatively benign lesion but metastases do occur. All testicular tumors should be considered malignant until proved otherwise. The treatment of choice in all malignant tumors of the testes is early radical surgery including an orchiectomy and resection of preaortic lymph nodes to be followed by appropriate radiation therapy.²

Michelson reported 74 patients with congenital anomalies resulting from urogenital union failure. There were 29 with absence of the vas deferens. No reference could be found to testicular tumor associated with the absence of the ductus deferens.

CASE REPORT

A 24 year old man was admitted to this hospital on 25 July 1953. During examination of the genitalia because of sterility a small nodule was felt in the superior pole of the right testicle. The epididymis was very firm and slightly enlarged in the region of the globus major. The patient had not been aware of any changes in the testis. All laboratory and radiologic studies were within

normal limits. Exploration of the testicles, using the inguinal approach, showed a normal sized organ with a hard nodule at the superior pole. The globus major was cystic with markedly dilated epididymal tubules. The tunica albuginea was incised and a white, firm, smooth, round, 1.5 cm. nodule was shelled out of the surrounding normal testicular tissue. On section, the tumor was found to contain a laminated yellow tan material which was separated easily from the white fibrous capsule. There was a small cyst with a yellowish spot on the inner surface which was attached to one side of the capsule. Exploration of the cord failed to reveal the vas deferens. The microscopic section contained stratified squamous epithelium and also ciliated columnar epithelium. A biopsy of the testis showed active spermatogenesis, and some tubules contained sperm. On section of the epididymis, the cystic mass was found to contain clear fluid and the tubules were markedly dilated. The pathologic diagnosis was cystic adult teratoma of the testis and a cyst of the epididymis.

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Irradiation With Radioactive Particles

The interstitial use of radioactive particles seems to me much more rational than attempting to destroy a tumor mass by direct infiltration. If the lymphatic spread of the tumor is massive of course neither method can be effective since uniform distribution cannot be achieved. But if the nodes are not packed with tumor interstitially injected particles will be carried to them and can destroy the fresh tumor cells. The patient with testis tumor without palpable nodal metastasis seems the ideal candidate for this form of irradiation either as a preparation or as a substitute for radical node dissection. The approach is still experimental because of the possibilities of causing damage to normal tissues (such as the ureters and rectum) but it promises to be clinically useful.

—FRANK HINMAN Jr. M.D.

in A. M. A. *Archives of Surgery* p. 130 Aug. 1953

TORSION OF A PAROVARIAN CYST COMPLICATING PREGNANCY

Report of a Case

HAROLD PESCOVITZ *Capt n, USAF (MC)*

THOMAS A NOONE *Capt n, USAF (MC)*

TORSION of an ovarian cyst during pregnancy occurs three times as often as in the nonpregnant state. This brief report is presented because this serious complication of pregnancy can be prevented if an existing ovarian cyst is discovered early and surgically removed during the second trimester of gestation.

CASE REPORT

A 20 year old white primigravida was admitted to this hospital on 1 June 1953 complaining of sharp pains in her right lower abdominal quadrant and radiating into the groin. Her expected date of confinement was 24 June 1953. Two hours before admission she vomited. Urgency was noted but no frequency or dysuria. Past history and functional inquiry were negative.

Physical examination revealed that the fetal heart was normal. There was tenderness in the right lower abdominal quadrant without spasm, rigidity or rebound. No flank tenderness was noted. Peristalsis was normal. Rectal examination revealed an undilated cervix without any cul de-sac tenderness. The leukocyte count was 10 600 with 71 percent polymorphonucleocytes, and catheterized urine was negative. She was placed on bed rest and observed.

The blood cell count and a urinalysis were repeated seven hours later. The urine again was negative and the leukocyte count was 9 250 with 79 percent polymorphonucleocytes. Abdominal examination findings remained stationary. Conservative therapy was continued. Forty eight hours after admission there was an increase in the pain and tenderness with the pain now present to the right of the umbilicus and in the entire right iliac

fossa. The leukocyte count was 12 300 with 91 percent neutrophils. The urine remained negative. A roentgenogram of the abdomen showed an intrauterine fetus in a vertex presentation. In view of the persistence and increase in abdominal findings along with leukocytosis, surgical intervention was believed indicated. The preoperative diagnosis was acute appendicitis but a twisted right ovary or tube was also considered. The patient was taken to surgery 56 hours after admission. Under spinal anesthesia, through a small right pararectal incision, a gangrenous right parovarian cyst, which had undergone torsion was removed. The cyst had twisted on its pedicle two and a half turns in a counter clockwise direction. The appendix was normal and was not removed. She was ambulatory the following day.

Three days after surgery she delivered a normal male child weighing six pounds after a seven-hour labor. The patient's postpartum and postoperative course were uneventful. She was discharged on 12 June 1953, the ninth postoperative day and the sixth postpartum day. The pathology report was "parovarian cyst, right, with hemorrhage in the wall."

DISCUSSION

In the near term patient with a complication requiring an operation, the presence of the pregnancy should not be a limiting factor to surgical intervention. With the use of spinal anesthesia, there is little chance of the anesthetic agent having a deleterious effect on the fetus. Labor, postoperatively, may or may not occur. In its event, the proximity to term will produce a viable newborn. Cesarean section is not recommended. No elective surgery, e. g., appendectomy should be done which would prolong the procedure.

An ovarian cyst discovered during pregnancy should be removed during the second trimester in order to preclude complications of the cyst. Postoperative hormonal therapy should be used. Falk and Bunkin state "The discovery of medium or large cysts during the early part of the third trimester calls for temporizing. The fetus is not yet viable and operation always carries the risk of premature labor and strain on the abdominal wound. Hence, oophorectomy is unwarranted unless an emergency exists."

The differential diagnosis of a twisted ovarian cyst will include acute appendicitis and pyelitis. A flat roentgenogram of the abdomen should be done in all cases to demonstrate calculi (urinary, gallbladder, appendiceal), dermoid cysts, or ectopia. Serial white blood cell counts are of much diagnostic value. Exploration is warranted when the diagnosis of a "surgical abdomen" is made.

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Naval Inspector General Visits Dental Facilities in Far East



Rear Admiral Ralph W. Malone DC USN Inspector General of Naval Dentistry is shown talking with a patient in the clinic of the U S Naval Hospital in Yokosuka Japan while on a recent inspection of Navy and Marine Corps dental facilities in the Far East. The smiling Japanese dental technician is Fumiyo Abe. After leaving Japan Admiral Malone visited dental clinics in the Philippines Guam and Kwajalein before returning to Washington.

FAMILIAL PERIODIC PARALYSIS

MORTON H. RACHELSON *First Lieutenant USAF (MC)*

PERIODIC paralysis is characterized by recurrent flaccid muscular paralysis, usually of the lower extremities, familial history of the disease, loss of the deep tendon reflexes and electrical excitability of the muscles during the attack, low serum potassium during the paresis, normal sensorium and absence of sensory loss, and response to treatment with potassium salts. Although most writers credit Cavaré¹ with describing the first case, Talbott² includes, in his excellent review in 1941, an unrevised report by Musgrave,³ published in 1727. Talbott stated there are references in the literature to more than 400 cases.

Potassium was used as the treatment empirically as early as 1901 by Singer and Goodbody⁴ and Buzzard.⁵ It was first in 1934 that Biemond and Daniels⁶ noted a low serum potassium during the paralytic attack, but not until 1937 was the paralysis attributed to the low serum potassium by Aitken and his colleagues.⁷ In 1948, Gass and associates⁸ attempted to explain the pathologic physiology of the lowered serum potassium on the basis of hepatic glycogenesis, secondary to a stimulus from excessive carbohydrate metabolism, and thereby removing available serum potassium. McQuarrie and Ziegler⁹ called attention to influence of different foods in the diet in preventing the attacks.

Sporadic cases of periodic paralysis occur, and Herrington¹⁰ believed about 80 percent of them to be hereditary. Shinozaki¹¹ called attention to the association of thyroid disease in 62 percent of his cases.

Although periodic paralysis is more common in males in a ratio of 2:1 to 3:1, and usually makes its onset in the first two decades of life, it is rarely seen in military personnel. Reports of this disease occurring in the armed services have been described by Holmes,¹² Van Der Schaar,¹³ Johnson,¹⁴ and by Watson.¹⁵ Weissman¹⁶ recently described a case of nonfamilial periodic paralysis associated with thyrotoxicosis in a young veteran.

From U S Air Force Hospital, Walter Air Force Base, Mans...

CASE REPORT

A 20 year old white soldier was admitted to this hospital while on leave on 30 May 1953 with paralysis of both lower extremities and weakness of his arms of about six hours duration. When the patient was 16½ years old he found on awaking one morning that he was unable to move his arms and legs and this condition had lasted two days. During that time he was able to control his sphincters but he had no bowel movements. He had not experienced any peculiar sensations or loss of sensation. Since that time he has had one or two similar episodes every two months. He was inducted into the Army four months before admission and had had only one episode before the present illness. It had occurred two months previous to admission while he was on leave. He did not seek medical attention at that time. When the patient awoke on the morning of admission he was unable to move his legs and noted weakness in his arms. He had no difficulty swallowing and denied shortness of breath but he complained of back ache and a feeling of nausea.

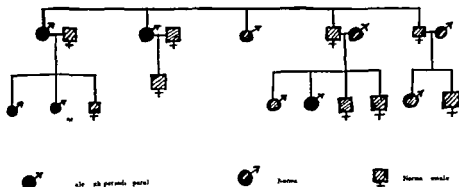


Figure 1 Genetic of family with periodic paralysis.

Several members of the patient's family (fig 1) have experienced similar intermittent episodes of paralysis involving all four extremities. A year ago his brother was discharged from the Army with the diagnosis of periodic paroxysmal paralysis which had been present since the age of 17 years and has been taking potassium chloride daily. His father now deceased had similar attacks of paralysis while he was young. An uncle had episodes of paralysis while he was in the Navy but not at present. A cousin has similar attacks. Information regarding the patient's paternal grandparents is not available but there is no paralysis in his mother's family. There is no family history of thyroid disease.

On physical examination the patient appeared to be well developed, well nourished, alert and not acutely ill. There was no evidence of head trauma; the neck was supple; the trachea was

in the midline and the respirations were not noisy. The thyroid was not palpable. The pupils were round, regular, equal and reacted to light. The extraocular movements were normal. Examination of the ears, nose and mouth revealed no abnormalities. The pharynx was clear with a good gag reflex. The chest moved symmetrically. There was flaccid paralysis of both lower with a paresis of both upper extremities. There was no sensory loss or paresthesias. There was complete loss of the deep tendon reflexes and of plantar response. Abdominal and cremasteric reflexes were normal. There was no spasm of the neck, back, or extremities.

Laboratory findings were a leukocyte count of 10,000 with 76 percent neutrophils, 18 percent lymphocytes and 6 percent eosinophils, hemoglobin 16 grams, hematocrit, VPC 45 per 100 ml, urinalysis normal, spinal fluid clear with no cells and protein of 11.6 mg per 100 ml. A roentgenogram of the chest showed no significant abnormality.

The day following admission, the patient was afebrile, and had full control of all his extremities with normal strength. During his first week in the hospital attempts to gain laboratory confirmation of periodic paralysis were undertaken. Serum studies for electrolytes showed all values to be within normal limits.

On 10 June 1953, he again was unable to move his arms and legs when he awoke. When examined several hours later, no muscle movements or resistance and no fibrillary twitching were discernible. Tendon jerks were poorly elicited on reinforcement, and were much weaker than previously described when the patient was free of his paralysis. An electrocardiogram was made and electrical muscle stimulation was attempted but by the time these two tests were completed, the paralysis was practically absent and normal results were obtained throughout. During this attack, serum sodium and potassium levels were 145 mEq/L and 2.6 mEq/L respectively. During the next two days, an attempt was made to study the patient's urinary excretion of potassium and sodium. Because of the inability to control the dietary intake of these electrolytes, not much significance can be attached to the nearly normal values achieved. The urine excretion was 207 mEq/L and the potassium was 82 mEq/L for the total 24 hour urine output (1,090 cc). Intravenous dextrose tolerance, sodium, and potassium tests were done on 18 June. Because only 70 cc of 50 percent dextrose was given intravenously, an inadequate result was obtained and no significant change in serum potassium or sodium levels was demonstrated.

On 17 June, 0.5 cc of 1:1000 epinephrine was given subcutaneously revealing potassium levels of the serum starting at 3.6 mEq/L and falling to 2.8 mEq/L. No loss of reflexes or paralysis was demonstrated although the electrocardiogram

showed flattening of the T waves. During the rest periods between tests the patient felt well and was ambulatory about the ward, with no complaints.

On 27 June, he was permitted to go home on a week end pass. Following a strenuous day's swimming he went to bed feeling well but slightly tired. The next morning he was unable to move his muscles and he was brought to the hospital completely areflexic and with his arms and legs paralyzed. The serum potassium and sodium levels at the time were 1.7 mEq/L and 147 mEq/L respectively. Electrical muscle testing at the time showed no response to faradic current and very weak response to galvanic current. One subsequent attempt was made to reproduce an attack of paralysis following recovery from this episode by giving both dextrose and insulin. This attempt also was unsuccessful for as in the previous attempts to reproduce the paralysis our anxiety to avoid serious hypokalemia with attendant respiratory paralysis and cardiac arrhythmia led to the administration of too small a dose of both dextrose and insulin. Liver function studies and the basal metabolism were normal. Despite our inability to reproduce the paralysis we believe that we have demonstrated a family history of the disease manifested by recurrent paralysis with areflexia, loss of electrical excitability and low serum potassium levels with complete recovery. The patient has been maintained on a dose of 3 grams of potassium chloride daily without any further attacks.

DISCUSSION

Potassium is the chief intracellular cation in the body the largest concentration being in the muscles. It is taken up in the formation of glycogen and is necessary in the formation of phosphorylated carbohydrates. Although periodic paralysis attributed to a low serum potassium level little is actually known about the metabolic fate of this mineral. Balance studies show that the potassium is not excreted in the urine and that the intake is normal. The spinal fluid potassium is normal and there are no significant changes in serum potassium. Although it has been postulated that the potassium is stored in the liver as glycogen liver function, thyroid and renal function studies have been normal.

There are several inciting factors which may bring about paralysis. Excessive carbohydrate metabolism, ingestion of large amounts of sugar is often the inciting factor. Others are trauma, disease, exposure to heat, excessive physical exertion, emotional stress, menstruation and constipation. Prodromal symptoms before the attack and usually include a feeling of warmth

of the extremities, aching in the legs, irritability, apprehension, fatigue, and sweating

The paralysis may be partial or complete, localized or generalized. It may involve the upper or lower extremities and may be unilateral. It usually begins peripherally and progresses centrally, and is most pronounced in the legs. The extensor muscles are more affected than the flexors, and the muscles of respiration and deglutition may be involved with serious consequence. A transient anuria may occur, but this is due to a lessened desire to void rather than to paralysis of the muscles. Recovery is usually in the reverse order.

Induced attacks may be produced by giving ^{17 18}

1 Glucose in large amounts (usually 200 to 250 grams)

2 Epinephrine in doses of 1 cc of a 1:1000 aqueous solution at hourly intervals. (It usually takes 5 cc to produce an attack. We had given only 0.5 cc and therefore failed.)

3 Ephedrine in doses of 0.1 gram orally every hour until the attack is produced.

4 Adrenal cortex extract

5 ACTH and cortisone, which are more dangerous because of their prolonged effects.

6 Insulin, with and without glucose

7 Large amounts of water orally, to cause loss of potassium by diuresis, which is a poor method.

Treatment is aimed at the prevention of attacks. The patient should avoid strenuous exercise, emotional excitement and exposure to cold and dampness. Carbohydrate intake should never be more than 100 grams at one meal, an effort should be made to lower the fat and carbohydrate and increase the protein intake, and completely eliminate candy, preserves, and pastries. Prophylactic doses of from two to 10 grams of potassium chloride are given daily.

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Stud th E aluat of th P nality Ch a t st cs / Succ / l
N l Aviat —Lt (jg) R ch rd St nl y Melt n MSC USNR U S N al
S hool of A t n M d c e Pe c l Fla

In-Fl ght Fe d g D ri g Sust d Fl ght of S gle-Pla J t A: craft—C l
Albert W V nS kle USAF (MC) Tur r A Force Ba G nd 1st Lt
R cha d J Hog USAF U S A Fo c Aero M d: l L bo t ry W ght
P tterso A F rc B Oh o

The Path l g c Effects of Ep cy l c Acc l t n—Lt (jg) Ma t Lipk
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Vary g A c l t v St —Capt Charl F G ll MC USN D cto
U S N v l A t o M d c l Accel t o L bor tory J h s ill P

30 March

Dev l pm t of a P al ty T t B t ry fo P ych t Scr i g of Fly g
P l—S ul B S ll Ph D U S Air For S hool of A t: Med
c R d lph Air Forc B T

St s F t Aff ct g Combat Pl t Kor a—C pt Bl s W Spa ks
USAF (MSC) U S Air For School f A tio M d c e R d lph Air
F c B T

Und tand g th Fe of Flying Synd m —Col L c: E G tt USAF
(MC) C sult t: P ych try F E t Air Forc T ky o J p n

St tus / V nt l t d G rm nt / H gh Sp d A craft—H A M h Ch f
E ronn nt S t U S A Fo Ae o Med l Labor tory W ght
P tterso A Fo B e Oh

Req ements f C w Eff ct v ne th B 52 St at g B mb —C l
D Fl c k: g t USAF (MC) A s st t D p ty Ch f f St ff f D elopm t
He dq rt A R ch d D elopm nt Comm d B ltm r Md

Analy s of Cew C p bl t D g T st Fl ght th B 52—Lt C l
G y Tow e d USAF T t P lot Boe g A rpl e Comp y S tti W sh

31 March

Limit g Factor P t t g th E F m N —He g E on G ke
D l g As t t t Ch f B o-A t S ct on d 2d Lt D ll R
Warren USAF U S A Fo c A Med c l L boratory W ght P tterson
A r Fo c B se Oh o

N and V b t Co trol the A Fo —Maj H rac O P r k USAF
Ch ef Bio-Acoust: s Se t U S A r F rc A o M d cal L borat ry
W ght P t t o A t F r B s Oh o

Jet Engine and Other Noise Problems Aboard Aircraft Carriers—Comdr Ralph Lawrence Christy Jr MC USN Senior Medical Officer U S S Franklin D Roosevelt.

Helicopter Evacuation of Battle Casualties in Korea—Capt Warren E Klein MC USN U S Naval Air Station Jacksonville Fla

Aircraft Accidents and Near Accidents—Capt Richard B Phillips MC USN and Lt Comdr Robert B Giblin USN U S Naval Air Station Glenview Ill

Aircraft Periscopes for Pilotage—Lt Col George O Emerson USAF (MC) Chief Vision Section U S Air Force Aero Medical Laboratory Wright Patterson Air Force Base Ohio

The Role of the Proprioceptive Senses in the Performance of Instrument Flight—Comdr Norman L Barr MC USN Head Aviation Medicine Division Naval Medical Research Institute Bethesda Md

Splenic Infarcts Associated With Hypoxia—Lt Col James P Jernigan USAF (MC) Capt Charles E Engel USAF (MC) and Capt Wesley L Peterson USAF (MC) Francis E Warren Air Force Base Wyo

Ant malarial Drugs in Flying Personnel—Col William R Haas USAF (MC) Consultant in Internal Medicine Office of the Surgeon General Department of the Air Force

Some Aeromedical Aspects of All Weather Flight—Comdr Sidney I Brody MC USN Medical Liaison Officer Bureau of Aeronautics Department of the Navy

Medical Teaching and Research

The main problem in medical education everywhere is to bring about a more general appreciation of the value of teaching. Teaching is not just a bagful of technical tricks nor is it a tiresome waste of time. It is or it ought to be the reverse of a coin whose obverse is research. It is true that nowadays nearly every teacher is also a research worker but is it the research that gets the pay and the glamour. This breeds the idea that going into the anatomy dissecting room or the physiology lecture theatre is an unwarrantable interruption of important work. Until people realize that to stimulate others to find things out is as useful as to find things out oneself and that the two jobs should go together and not in separate compartments the teaching of basic science will remain a profession in which deficiencies will have to be patched up and mistakes made good.

Deaths

GARCIA Charles Todd Major USAF (MC) Bellingham Air Force Base Washington D C graduated from Ohio State University College of Medicine in 1936 and died of typhoid fever 15 May 1949 died 18 December 1953 age 47 from tuberculosis contracted in Mexico

GRAVELINE Ernest Louis Jr Captain MC USAF 23rd Infantry Regiment Second Division Korea graduated from University of Nebraska College of Medicine 1949 certified by the National Board of Medical Examiners died of typhoid fever 24 June 1949 died 15 October 1951 age 29 from community spread

HAYDU Joseph Frank Jr Captain DC USAF Camp David Republic of the Philippines died from typhoid fever 7 September 1944 died 29 October 1953 age 36 from typhoid fever spread in Philippines

HUTTO James Foy Lieutenant DC USN Naval Air Station Jacksonville Florida graduated from Harvard University Dental School in 1949 died of typhoid fever 29 June 1949 died 26 December 1953 age 30 of gunshot wounds sustained while hunting game in Mississippi

MARVIN Theodor Richard Lieutenant MC USNR Marine Air Group 1 Japan graduated from Ohio State University College of Medicine 1943 died of typhoid fever 7 January 1953 died 30 December 1953 age 37 from typhoid fever contracted in Atlantic

SLOGOFF Isaac Lieberman Lieutenant Colonel DC USAF 97th General Hospital Frankfurt Germany graduated from Temple University School of Dentistry 1941 died of typhoid fever 30 July 1953 died 18 November 1953 age 41 from typhoid fever contracted in 97th General Hospital

TINSLEY Herbert F. Lieutenant USAF (MSC) 301st Medical Group Barksdale Air Force Base Louisiana died of typhoid fever 12 June 1951 died 18 December 1953 age 32 from typhoid fever contracted in

Ophthalmology Elizabeth Ingham John Luke devoted to the use of the microscope concerning the eye 1586 and wrote Chyrurgery Oculi terms the first in 1602 but did

beginnings as a specialty under Queen's College of Physicians granted a faculty to teach of the eye but he was strictly limited and Dr Bailey's tract *A briefe Treatise of the Eyesight* was first published in 1640 editions Richard Banister Master in the Institution in Physics whom A Sorsby succeeded in British ophthalmology qualified his *Breviary of the Eyes* until 1622

— ARTHUR S. M. NALTY

in *British Medical Journal* p 1183 May 30 1953

Official Decorations

SILVER STAR

John F. Curtis Lt. (jg) MC USNR
William C. Davis Lt. (jg) MC USNR

Leo T. Delaney Jr. Lt. (jg) MC USNR
Philip G. Dennen, Lt. (jg) MC USNR

LEGION OF MERIT

Lawrence E. Bach Capt. MC USN
William W. Cox, Lt. Col. MC USA
Harry E. Gunn Lt. Col. USAF (MSC)
Bill J. Harris Comdr. DC USN
Kenneth B. Johnson, Lt. Col. MC, USA

Irvine H. Marshall Lt. Col. MC, USA
Robert J. Platt Col. USAF (MC)
Barnhard R. Reinertsen, Capt. MC USNR
Clifford A. Stevenson, Comdr. MC USN
Max H. Watkins Col. MC, USA

SOLDIER'S MEDAL

Norman G. Miller 2d Lt. MSC, USA

BRONZE STAR MEDAL

Preston L. Adam First Lt. MSC USA
Arthur C. Anderson First Lt. MSC, USA
Robert E. Baldwin Capt. MC USA
George C. Beattie Lt. Comdr. MC USN
Robert B. Benthack First Lt. MC USA
Clifford A. Best Col. MC USA
Russell H. Blood, Capt. MC USN
Domenico Caporale First Lt. MSC USA
John C. Carden, First Lt. MSC USA
Paul E. Clemens Lt. Col. MSC USA
Wendell H. Dickerson Lt. Col. MSC USA
John E. Dolph Lt. Col. MC USA
Robert O. Ellington First Lt. MSC, USA
David Fisher Lt. Col. MC USA
James F. Fitzgerald Capt. MC USA
Frank A. Folk Lt. MC USNR
George M. Fries Jr. First Lt. MSC USA
Donald A. Fusco Capt. MC USA
Raul Garcia First Lt. MC USA
Robert M. Gillitt Capt. MC USN
Malcolm J. Goos 2d Lt. MSC USA
Dell M. Gray Major MC, USA
James D. Harvey Capt. MC USA
Doyle T. Hatch First Lt. MC USA

Clarence J. Jackson, First Lt. MSC, USA
Thurl E. Jartett, Comdr. MC, USN
Robert B. Johnson Comdr. MC, USN
James R. Karr Col. MC, USA
John J. Kelly Lt. Comdr. DC, USN
Arthur S. Kidwell Maj. MSC, USA
Robert A. Knox First Lt. MC, USA
Clayton B. Krewson, Maj. DC USA
Robert J. Lavin, Capt. MC, USA
Harold W. Layer Col. MSC USA
Irvin B. Levi Capt. DC USA
Victor A. Machelski First Lt. MC, USA
Leopoldo E. Margalida First Lt. MSC USA
Harry E. Mason First Lt. MC USA
James A. McLaughlin, Lt. Comdr. MC USN
Jack P. Mercer Capt. MC, USA
Earl W. Mitchell Maj. MSC USA
Dryden P. Morse First Lt. MC USA
Robert E. Murto Lt. MC USNR
Robert E. Nelson Capt. MSC USA
Edward T. O'Dell Capt. MC USA
Louis T. O'Desky Capt. MC USA
John F. Otto Jr. First Lt. MC, USA
Howard G. Parker Capt. MC USA

The names of officers of the medical services who have been awarded decorations by the United States Army Navy or Air Force since the beginning of the current campaign will be published following receipt of this information from the appropriate authorities.

BRONZE STAR MEDAL—Continued

R bert L Re Fir t Lt MSC USA
 Ce l D R gg Capt. MC USN
 F cis A Ro b Lt MC USNR
 Donald H R bi so Maj MC USA
 F d k Ro be g Fir t Lt MC USA
 N l D Sa bo Lt (jg) MC USN
 J ph S nt Maj MSC USA
 Da d W Sil erm 2d Lt MC USA
 Walt C. So bc t, First Lt MC USA
 J h F St M ry Lt MC USNR
 Cl f Swaff d Fir t Lt MC USA

Elb dg W T ll d Lt C l MC USA
 Clyd C. Thomp J Fir t Lt DC USA
 W ld G Thybe g F st Lt MC USA
 B l V t Fir t Lt MSC USA
 L y F V L kum Lt (jg) MC USNR
 Ha y H W ld Maj MC USA
 J hn J W d Capt. MSC USA
 Da d W W d ll Maj MC USA
 Roll D Will d F t Lt MC USA
 Se nl y C. W dl y M j MSC USA
 Ha ld R. Y be Lt (jg) MC USNR

AIR MEDAL

Ea l L R ll J Capt. MSC USA

COMMENDATION RIBBON

Ol er K. Ag Capt. MC USA
 Robe A Ald Lt (jg) MC USNR
 Ma Amago Fir t Lt USAF (MSC)
 J h L B lla k 2d Lt MC USA
 L wyd W Ball ty C l USAF (MC)
 Tyr E. Bank J Lt MC USNR
 Berna d A. B ll w Lt MC USNR
 M A B d Lt (jg) MC USN
 Al W Bronw ll Capt. MC USA
 Da d B Ca m ha l J Lt MC USN
 J h F Ch Comdr MC USN
 J h H Ch filly Lt Comdr MC USN
 J k T Ch b lm Lt (jg) MC USNR
 F X. Cl p Fir t Lt MC USA
 Geo g Co Fir t Lt MSC USA
 P ul B Cook First Lt MSC USA
 F nk S. D ma J Capt. MC USA
 Ed M Daugh y Lt NC USN
 V t M. D w y Lt C l USAF (MC)
 Robert W Ea tma Lt (jg) MSC USN
 J hn F Eg Lt (jg) MC USNR
 Donald J F guso Lt Col USAF (MSC)
 Ri ha d G Fl a, First Lt MC USA
 W ll m S. Fra C mdr MC USN
 W ll m W F nkl C l USAF (DC)
 Cal W H F dr k M j USAF (MSC)
 Be na d Gel Lt (jg) DC USNR
 Ha l nd W Ge d Lt (jg) DC USNR
 Da d O H m r k Ens. MSC USN
 Ralph W Ha dy Lt DC USN
 Edg V Ha Lt (jg) DC USNR
 Howa d E Ha se Lt (jg) MC USNR
 Edw d C. H Lt MSC USN
 B ba M. Hodgk F st Lt NC USA
 Rus ll B Hof tad Capt. DC USA
 Edw d A Holdr Capt. MSC USA
 Park C. Je Capt. MC USA

Robert K L w Ens MSC USN
 R be S Ma Do gh CWOHC USN
 O c T M Do ugh J Comdr MC USN
 J m B M K a HOWC USN
 W ll m M Kow F t Lt MC USA
 F k J M g J Lt (jg) MC USNR
 Geo g W Mo Fir t Lt DC USA
 W ll m B N l Lt Comd MC USNR
 Ruffus H New Fir t Lt MSC USA
 R cha d E Olson Fir t Lt MC USA
 R chard J O Sh F st Lt MC USA
 Har ld V P lm t Lt MC USN
 J hn A. P w Capt. MC USA
 H nry A Roma F t Lt MC USA
 M ll W Rush r Lt Comdr MC USN
 A g M. Sal d C pt. MSC USA
 J hn A S l mo 2d Lt MSC USA
 Ha y C. S mmo Lt (jg) MC USNR
 Ge g N Sa m F t Lt DC USA
 Donald M. Schr d Fir t Lt MSC USA
 Ri h d L Schwartz Capt. USAF (MC)
 W ll m E Sk F t Lt MC USA
 A na M. Smyth Fir t Lt NC USA
 W ll m M Snowd Comdr MC USN
 Ar bur H St Lt (jg) MC USNR
 F J S g 2d Lt MSC USA
 Barba L T urt b Ens NC USN
 Sam l C. T yl Lt MC USNR
 J h F T Lt (jg) MC USNR
 F de k V P nak Lt (jg) MC USNR
 Fr nk P W ts F t Lt MSC USA
 F t J h W dd ll J Capt. MC USN
 Do F W hrl y Lt DC USNR
 Verno H W ld Fir t Lt MSC USA
 Ha ld E Wood J Lt MC USN
 Ma T Y Comdr MC USN
 H nry E Z ra ki Capt. MSC USA

A MESSAGE FROM THE A M A

Last month, in the first article of this series, Dr Edward J McCormick, President of the American Medical Association, referred to the Association's interest in physicians in uniform. While it is impossible to date the inception of our concern with military medical affairs, it is safe to talk about the tremendous increase in the activities in this field during the last 10 years. The acceleration of this work during World War II culminated in a joint survey by the Association and the armed services of the 55,000 civilian physicians who were called to duty during the war to determine the effects of their withdrawal on the welfare of the country.

The results of that survey led to the creation, in June 1947, of the Council on National Emergency Medical Service. Although many of the other councils, bureaus, and departments of the Association are concerned with related problems, the Council on National Emergency Medical Service has been charged with the primary responsibility in matters relating to the nation's medical service in time of national emergency.

In its specific projects and day-to-day liaison with the armed services, the Council has made a sincere effort to help rather than to obstruct. It has always maintained, however, that civilian participation in military medical planning is imperative.

One of the principal interests of the Council during the past several years has been the "Doctor Draft Law." Since the passage of that legislation in September 1950, an attempt has been made to (1) facilitate and increase the efficiency of the administration of the law, (2) effect a timely and orderly system of recall and rotation of medical reservists, (3) prevent a repetition of the medical overstaffing that occurred in World War II, and (4) curtail the utilization of medical personnel on nonprofessional assignments and in the treatment of dependents of service personnel.

There are many less publicized but equally important activities of the Council that are conducted for the benefit of physicians in service. One of these that began about 18 months ago,

From the Council on National Emergency Medical Service of the American Medical Association. The views and opinions expressed are not necessarily those of the Department of Defense.—Editor

and which will be discussed more fully in a later article is a continuing survey of physicians released from active military service. The results of this survey will be used as the basis for a series of conferences with the Assistant Secretary of Defense (Health and Medical) and the Surgeons General designed to improve further the utilization of medical personnel by the armed services and to formulate a more effective voluntary officer procurement program. Another project has been planned to acquaint physicians being released from active service with existing opportunities in civilian medical fields.

This program which was inaugurated by the Council in July 1952 with the co-operation of the department of Defense and the Selective Service System has the enthusiastic endorsement of the state medical societies and the chairmen of the Selective Service medical advisory committees.

After receiving the names of physicians to be released from active duty the Council communicates with each of them to determine his postservice plans, his medical qualifications and specialty as well as the name of the state in which he prefers to work. The names of physicians interested in receiving additional information are then sent to the Selective Service medical advisory committees and to the executive secretaries of the appropriate state medical societies. While these names were forwarded initially for the primary purpose of obtaining replacements for physicians temporarily deferred under the

Doctor Draft Law, the project now has greater value as a location service for physicians returning to civilian life. In communicating with state medical societies the Council uses the established procedures for placement of physicians that have been followed for some time by the Council on Medical Service of the Association.

From 28 July 1952 to 1 January 1954 letters were sent to 5 845 individual physicians. Of this number 1,131 requested further information.

It is the earnest hope of the Council and the Association that the program will be of real assistance to individual physicians and to state medical societies and that it will be successful in the satisfactory location of many physicians upon their release from active duty. Any physician on active duty or who recently has been released from service interested in receiving this service should communicate directly with the Secretary of the Council, 535 N Dearborn Street, Chicago 10 Ill.

Regular Medical Corps Officers Certified by Specialty Boards

American Board of Psychiatry and Neurology

Organized in 1934, this specialty board on 30 June 1953 had granted certification to 4,646 physicians to become the fourth largest American Board. A separate certificate is given in psychiatry and in neurology, and two certifications or a combined certificate to those qualified in both fields. A total of 79 regular Medical Corps officers of the three services are recognized as specialists by this board. They are:

PSYCHIATRY AND NEUROLOGY

Ale L. Brown <i>Lt. Col. USA</i>	Emmett B. Littoral <i>Col. USA</i>
John M. C. Idwell Jr. <i>Col. USA</i>	Georg N. Rines <i>Capt. USN</i>
Rawley E. Chambers <i>Brig. Gen. USA</i>	Stephen W. R. o. <i>Lt. Col. USA</i>
Roy E. Clusen Jr. <i>Lt. Col. USA</i>	Robert L. Williams <i>May. USAF</i>
Henry S. Colony <i>Comdr. USN</i>	
Albert J. Gliss <i>Col. USA</i>	

PSYCHIATRY

William H. Anderson <i>Lt. Col. USA</i>	David C. Gede <i>Capt. USN</i>
James M. Bailly <i>Lt. Col. USA</i>	Lucio Gatto <i>Col. USAF</i>
Wren J. Bark <i>Lt. Col. USA</i>	Raymond L. Hicks, <i>Lt. Col. USA</i>
Thomas G. Bask <i>Capt. USA</i>	Robert P. Hargraves <i>Lt. Col. USA</i>
Eaton W. Bennett <i>Col. USA</i>	Thomas A. Harris <i>Comdr. USN</i>
Ronald V. Berry <i>Comdr. USN</i>	Thomas B. Hauschild <i>May. USA</i>
Charles T. Brown, <i>Lt. Col. USA</i>	William H. Husman, <i>May. USA</i>
John W. Burkett <i>May. USA</i>	Frank Hladky Jr. <i>May. USA</i>
Richard R. Camelon <i>Lt. Col. USA</i>	Bartholomew W. Hogn, <i>Rear Adm. USN</i>
Elmer L. Casey <i>Capt. USN</i>	Joseph J. Honisher <i>Col. USA</i>
Robert L. Christensen <i>May. USA</i>	Eugene R. Inwood <i>Col. USA</i>
Robert M. Counts <i>Capt. USA</i>	Richard G. Johnson <i>Capt. USA</i>
James F. Donovan <i>May. USA</i>	John Kavanagh <i>May. USAF</i>
David S. Evans <i>Lt. Col. USAF</i>	Julian C. Kennedy <i>Lt. Col. USA</i>
Charles S. Finch, Jr. <i>Lt. Col. USA</i>	Edward J. Kollar Jr. <i>May. USAF</i>

This is the fifth of a series. The names of officers certified by the American Board of Orthopedic Surgery will be published in the March issue.

PSYCHIATRY—Continued

Harry H. L. p	Comdr USN	L. I. A. Schwartz	Capt. USA
John J. Marre	Col. USA	Rog. D. Shriman	Comdr USN
Thomas W. M. Da. l	Capt. USN	Mervyn Shoo	Comdr USN
John F. M. Mull	Capt. USN	Gerald W. Smith	Capt. USN
Al. E. Miller	Col. USA	Philip B. Smith	Lt. Col. USA
Cl. en. S. Mill	May. USA	Stephen M. Smith	Capt. USN
Stephen Mourat	Lt. Col. USA	John N. Sus	Comdr USN
R. ha. d. f. Mulholland	Lt. Col. USA	R. bert E. Switz	Lt. Comdr USN
Charles S. Mullin	J. Comdr USN	John W. Thoma	Comdr USN
Ira C. N. hol	Capt. USN	Sam. l. V. Thompson	Comdr USN
F. l. H. O. k	Comdr USN	R. hard E. Troy	May. USAF
Ma. E. Perkin	J. May. USA	John F. T. l.	Lt. Col. USA
Donald B. P. so	Col. USA	R. bert L. W. gne	Comdr USN
Thomas P. R. g.	Capt. USN	Oswald M. Wea	Lt. Col. USA
Ma. E. R. ud. ba. h	Capt. USN	William E. Wilkinso	Col. USA
P. el. J. Schrad	Lt. Col. USA	John N. William	Capt. USN
		F. L. W. l. ghby	Comdr USN
		Albert J. Zuska	Comdr USN

NEUROLOGY

John W. K. mbl	Col. USA	Willard H. P. nn. ll	Capt. USAF
Arthur J. L. s.	Lt. Col. USA	John W. Sum	J. Lt. Col. USA
P. P. Ma. hung	Comdr USN		

Handicapped Workers in Industry

Physicians interested in occupational medicine can be of great service to the disabled by educating industry to the physical capacities of handicapped workers. Long accustomed to thinking in terms of disease, doctors are now beginning to think in terms of health. The residual capacities of the patient are at least as important to his adjustment as the physical defect. Physicians must train their sights on what the patient has left with a positive forward-looking approach. Physicians can help place qualified handicapped workers in industry. The necessity of restoring handicapped persons to productive work is especially important at this time of manpower shortage. The potential abilities of the disabled must be developed, not only for their benefit but to the advantage of the nation as a whole.

—HENRY H. KESSLER, M.D.

Journal of the International College of Surgeons p. 372, Sept. 1953

Publications by Officers of the Medical Services

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BOOK REVIEWS

ABSTRACTS ON MILITARY AND AVIATION OPHTHALMOLOGY AND VISUAL SCIENCES Volumes I and II by *Conrad Berens* M D and *L. Benjamin Sheppard* M D Vol I 539 pages Vol II 425 pages. The Biological Sciences Foundation Ltd Washington D C. 1953 Price \$40 set

In this significant work that has been in preparation for several years, nearly 2,500 published articles from world wide sources are made available in condensed form. The authors, who are distinguished in their specialty, have rendered a valuable service by its publication to military physicians, ophthalmologists, and to those engaged in aviation medicine and in the visual sciences. They have, in addition, directed attention to the importance of visual defects and ocular pathology in both military and aviation medicine.

The first volume of the set contains abstracts through 1940, the second covers the World War II period through 1945. There are forewords by Major General R W Bliss USA (Ret.), former Surgeon General of the Army, and Major General Malcolm C Grow, USAF (Ret.) the first Surgeon General of the Air Force. Each volume contains an extensive table of contents listing the subject matter alphabetically so that the reader need only look under the general heading in which he is interested in order to find a specific topic. For example the subject of depth perception is divided into 16 topics from accidents to visual acuity, also listed alphabetically. This expanded table of contents serves in lieu of an index, and is a satisfactory substitute in a work which must necessarily include many cross references to aid the reader. The addition of an author index would have been helpful.

The abstracts are clearly written and vary from a few lines to a page or more depending on the importance of the article. Because of his early research achievements in aviation ophthalmology for the Air Service of the Army in World War I, Dr Berens was able to select judiciously for abstracting from among the many reports that have appeared in foreign journals. The usefulness of the books is broadened by the inclusion of a large number of publications on aviation medicine which are only partially or indirectly related to ophthalmology.

These volumes will be welcomed by those who are concerned with the published reports in the fields they cover. Unfortunately the high price of the set will tend to restrict it to libraries and reference collections but it will nonetheless fulfill its commendable purpose —Col R J Benford USAF (MC)

WATER ELECTROLYTE AND ACID-BASE BALANCE Norm l d P th log
Physiol gy a B f Th py by H rry F W b g M D 245
pag s ll trated Th Will m & W lk Co B l t m e Md 1953
Pr ce \$5

This book presents a clear and concise consideration of the subject. It is divided into two sections: the first devoted to normal physiology and the second to pathologic physiology. The essential information is explained simply and clearly and summarized in excellent tables. Much of the redundant material found in other books on the subject and the presentation of representative cases which are found in many works of this sort have been eliminated. Many controversial points are handled skillfully and the only minor criticism is the failure to follow up the introduction of the Bronsted terminology with a truly modern description of the acid base phenomenon.

This book is recommended for the student and practitioner who wish to become acquainted with the modern conception of water and electrolyte balance. It contains a complete glossary of terms and an excellent index as well as a complete bibliography which will render it particularly usable to advanced students of fluid balance problems.

—Lt Col F M Townsend USAF (MC)

PITUITARY CHROMOPHOBE ADENOMAS N urol gy Met bol m Th py by
Job l Nurnb g M D d S l R Ko y M D 282 p g ll s-
trat d Sp g P bl shi g Co I N w Y rk N Y 1953 P c \$7

This monograph on pituitary chromophobe adenomas according to the authors attempts to correlate information from several medical disciplines in order to portray the syndrome of chromophobe adenoma of the pituitary in its setting of modified function. The authors have supplemented their text in this difficult task with about 500 references to the literature.

The monograph reports the results of clinical studies of 117 patients. The tumor cell type, its location and its effect upon neighboring structures were verified surgically or by autopsy in 115 instances. In addition the general anatomy and physiology of the pituitary and hypothalamus and the effect of deranged sellar function upon the other endocrine structures are summarized.

Obviously the many facets of the pituitary hypothalamic syndrome can only be indicated in so short a space but nevertho-

less this monograph serves such a purpose well and should be of interest to internists, neurologists, and neurosurgeons

—*Lt W F Stafford, MC USNR*

ATLAS OF REGIONAL DERMATOLOGY by Ernest K. Stratton M D Harry L Arnold Jr M D Maurice J Costello M D Lewis A Koplik M D and Paul Fasal M D 274 pages illustrated Charles C Thomas Publisher Springfield Ill 1953 Price \$15

This new work presents in picture form the various dermatoses, primarily for the student who needs visual help in identifying skin diseases. There are 540 black and white clinical photographs and 21 photomicrographs, divided into eight regional groupings with a classification of the diseases of each region.

Brief descriptions accompany less than half of the pictures. A few diseases have descriptions appearing more than once; psoriasis is described similarly in six different regions. Other diseases are not described anywhere in the book and are accompanied only by a title. No bibliographies are listed. Although a wide range of dermatoses is presented, many skin diseases are not illustrated.

The photographs are, in general, excellent and the student would do well to use them in his studies and reviews. It would be better if the inadequate discussions of treatment were left out as they are not always modern in concept and will tend to become less so thus decreasing the permanent value of the book. The space gained could be used to advantage for more extensive differential diagnoses in the present descriptions, or descriptions might be given for some of the illustrations that have only a title.

Dr Arnold contributed a section on Leprosy with thirteen photographs and three photomicrographs. It is seldom that one sees a subject presented in so concise, so clear, and yet so complete a manner. Dr Costello's contribution is a 10-page series of pictures with short discussions of "Skin Manifestations of the Acute Infectious Diseases." Pictures of erythema infectiosum, roseola infantum, and rickettsialpox, not ordinarily found in textbooks on dermatology, are included. The 31 color photographs by Dr Fasal and other color pictures of skin conditions published in pamphlet form by various pharmaceutical manufacturers, show that in addition to location and structure, the color is characteristic and aids in visual study.

Generally speaking this book deserves commendable mention but a complete modern atlas in color, with standard nomenclature must be produced before the student and the practitioner will profit from its use, as they might.

—*Capt W N New, MC U*

BAILEY'S TEXT BOOK OF HISTOLOGY : ed by *Philip E. Smith* Ph D
 Sc D d W l f d M. Cop bav Ph D 13th d t o 775 p g
 ill str t d Th Willi ms & Wilk s Co B ltim Md 1953 P
 \$9

During the five years since the publication of the twelfth edition of this justifiably popular textbook of histology much has been learned about the relationships between structure and function and spectacular advances have been made in electron microscopy and histochemistry. The new thirteenth edition incorporates these advances and other important results of recent study and research.

Numerous passages and sections have been entirely rewritten notably a major part of the chapters on the reproductive systems the endocrine glands and the organs of special senses. Among the many new illustrations which include six color plates are some excellent reproductions of electron micrographs. The structure of mitochondria is particularly well illustrated. Additional pertinent references have been added to the bibliographies following almost every chapter.

This standard text which is about to enter its fiftieth year of widespread use both here and (more recently) in Spanish language countries abroad is meant primarily for medical and dental students rather than for teachers and research workers. It is clearly written well indexed and authoritative.

—*Capt B F Avery MC USN*

ADVANCES IN PEDIATRICS ed d by *S Z Levi* V I 6 323 pag 1
 illustrated Th Y r Book P blsh r Inc Chicago Ill 1953 Pr
 \$7 50

This volume presents seven monographs of current interest especially to the pediatrician. The subjects are covered comprehensively by recognized authorities in their respective fields. Four of the contributions pertain to the neonatal period emphasizing the importance of this area in pediatrics. "Preventive Prenatal Pediatrics" "Intestinal Obstruction in the Neonatal Period" "Hemolytic Disease of the Newborn" and "Pulmonary Pathology in the Newborn." The other three subjects, "Lymphosarcoma in Childhood" "The Lipoidoses" and "Megaloblastic Anemia of Infancy" serve well the purpose of this series of annual reviews to keep the physician informed of recent advances and to chart future trends in pediatric research.

The style is pleasing and necessary photographs of good quality and clear illustrative charts are presented. Each subject has an extensive bibliography and subject and author indexes are contained in the last 17 pages. Where a good pediatric library is desired this volume should be included. No better reference of subjects covered is available. —*Col O C Bruton MC USA*

THORACIC SURGERY AND RELATED PATHOLOGY by G. L. Eckstein
 M. D. and A. L. Brown M. D. 644 pages 11 illustrated
 C. C. Thomas Springfield, Ill. N. Y. 1953 Price \$15

This excellent book fulfills a real need. Although several worthwhile monographs and technical manuals pertaining to thoracic surgery have appeared within recent years not since the publication in 1935 of *Surgical Disorders of the Chest* by Graham Singer and Ballou has there appeared a comprehensive and authoritative text devoted to this subject. Thoracic surgery was almost in its infancy at the time of publication of Graham's book there is no doubt that the specialty has made tremendous strides since that time. The authors of this volume have covered the new developments in this rapidly expanding field in an admirable manner. The result is a book that can be recommended without hesitation to all who are interested in this specialty.

In this treatise no important thoracic surgical subject has been neglected and all are discussed clearly, concisely, and adequately. There is excellent correlation between the clinical symptoms, the physical findings, and the pathologic features of the various disorders. The rationale of the surgical procedures utilized in the management of each of them is made clear. Numerous surgical techniques have been devised for the treatment of many of the lesions of the chest and it would be quite impracticable to describe all of them in detail in a volume of this type. The authors have exercised rare judgment in selecting for description those operations that are most widely used and generally accepted.

Nowhere in this fast advancing field have the changes been more swift than those related to the surgical treatment of pulmonary tuberculosis. This is underlined by the fact that the authors added a footnote modifying the policy governing the employment of continuous combined chemotherapy advocated in the original manuscript. The fact that this change was incorporated exemplifies the up-to-date nature of the book.

One hesitates to find any fault with a work of such general excellence. This reviewer is disturbed, however, to find the indications for resection in pulmonary tuberculosis restricted to those that are traditional and time-honored, namely, round discrete foci, bronchostenosis, tuberculous bronchiectasis, thoracoplasty failures, malignancy, suspects, the totally destroyed lung (especially with empyema), and lower lobe cavitation (especially of the tension type). Practically everyone agrees with these indications, but there are many who believe that the small localized lesion, confined to one or two segments, can be managed more quickly, safely, and with greater assurance of success by

segmental resection than in any other manner. Whereas the authors advocate excisional surgery only for the patient whose lesion could probably be managed successfully in no other manner, many qualified observers now are convinced that resection is the procedure of choice in many properly prepared and wisely selected patients who could probably be treated successfully by any one of a variety of methods. This and other minor objections do not alter the fact that the authors have done an outstanding job in their discussion of surgical disorders of the chest wall, lungs, pleura, mediastinum, esophagus, heart, and great vessels.

Every doctor interested in surgical conditions of the chest should own a copy of this book. It is well illustrated, adequately indexed, and there is an excellent bibliography at the end of each chapter.—*Capt C F Storey, MC, USN*

CLINICAL DISORDERS OF THE HEART BEAT by Samuel Bellet, M D
373 pages 164 illustrations Lea & Febiger, Philadelphia, Pa, 1953
Price \$8.50

The discussion of cardiac arrhythmias plays a prominent role in most general textbooks of medicine as well as those limited to clinical cardiology, yet this book is entirely and effectively devoted to a presentation of this subject. Current data is clearly correlated and reviewed in detail in such form that it can be readily appreciated and applied by the student, the teacher, the general practitioner, and the specialist in cardiology, internal medicine, anesthesiology, and surgery.

The contents are presented in four main sections (1) general considerations, which stresses in particular basic pathophysiology and general principles, (2) a discussion of individual arrhythmias, which presents the manifestations, diagnosis, and treatment of each disorder and gives details of mechanisms; (3) the arrhythmias in certain clinical states, which include not only those commonly considered but also those associated with pre-eclampsia, anesthesia, surgery, angiocardiology, cardiac catheterization, and trauma (4) drugs used in therapy of arrhythmias. Each section is essentially complete in accordance with its general heading so that there is repetition when the book is viewed in its entirety. Nevertheless, the repetition is of definite advantage whether one uses the book as a text or a reference. In areas of controversy and differences of opinion, the salient features of the various controversial aspects are well presented and in each instance the author concludes with the opinion he believes are most logical in the light of present knowledge.

This book is well organized, well written and well illustrated and has an excellent bibliography. It should be a definite asset to any library.—*Capt J H Ward Jr MC USN*

STUDY GUIDE FOR CLINICAL NURSING a Co-Ordinat d Surv y I t gr t d
 With E tials f th Ba S s p pared under th d r t on of
 Em ly C C d w R N M S 563 pages J B L pp nc st C Ph l
 d lph P 1953 P \$6

This is a volume prepared primarily for two groups of nurses clinical students and instructors. The editor's explanatory preface focuses clearly and concisely upon the intended function of the volume as a guide. Flexibility in its use is invited in accordance with individual needs and circumstances. Upon this factor the extent of its real usefulness depends.

A problem solving approach to nursing care planning is employed by the authors. Its inclusiveness implies that such care originates prior to the admission of a patient and terminates when he resumes his place in the community. In the interest of this interpretation the following factors are consistently considered: prophylaxis, early diagnosis, fears, special technical needs, nutrition, nationality, teaching plan (patient), cosmetics, rehabilitation, and available auxiliary community facilities.

In its treatment of the basic science of human growth and development the book is sound in its design to motivate thinking in terms of mass disaster. It is timely. Nursing care of the total patient on an individual basis is a growing concept among nurses. In the light of this idea this book should be of interest and value to instructors and graduate students.

—Lt L B Schoonover NC USN

THE OBSTETRICAL FORCEPS by L V D H M D 156 p s ll rated
 Charl C Th m s, P bl b Sp gf ld Ill 1953 P \$5.25

This monograph describes and illustrates the different methods of forceps application, traction, and rotation in normal as well as abnormal fetal presentations. An introductory historical chapter adequately covers the development and use of the obstetrical forceps from its inception to its place in current practice. The chapter discussing the reasons for the selection of a specific forceps for a particular obstetrical problem is logically conceived. Many uncontestable points are noted to alter the adage that "one forceps learned well is better than many types poorly learned."

The author has made a successful effort to crystallize the concept of forceps use in contemporary practice. The illustrations are numerous and clear but are frequently so placed in the text that they cannot be followed with ease as they are explained.

This concise and easily understood presentation will be useful as an adjunct in teaching good obstetrical technique as well as a guide to the general practitioner who does obstetrics.

—Comdr M A Godinez MC USN

INHALATION THERAPY AND RESUSCITATION by Mervyn A. Katz, M. D.
43 pages illustrated Charles C Thomas Publisher Springfield Ill.,
1953 Price \$7.50

This monograph belongs in the general category of a medical reference book rather than a textbook. The author's objective is to clarify much of the confused terminology and nomenclature and to present in a brief, clear manner much of the previously written material on the subject.

The author's style is simple and easily understandable even to those not familiar with the field. His format is logical and the subdivisions and minor categories are not excessive. There were no obvious errors though several points are of a controversial nature. Photographs are more numerous than schematic drawings and graphs. The author indicates each source by number in an extensive bibliography. The index is complete and contains reference to every item of subject matter, equipment, technique and to authors cited. There are three sections of the book which could have been more elaborately treated viz the transport of oxygen and carbon dioxide in the blood, helium inhalation, and cardiac resuscitation.

The book is a clearly written, concise, and complete text on the subjects of its title. It is recommended for anesthesiologists, residents in training, nurse anesthetists, and oxygen therapy technicians.—Col F. C. Dye, USAF (MC).

THE MANAGEMENT OF PAIN With Special Emphasis on the Use of Analgesic Block in Diagnosis, Prognosis and Therapy by John J. Murrell, M.D.
1533 pages 785 illustrations on 444 figures 14 x 11 1/2 inches Philadelphia Pa. 1953 Price \$24

TESTS AND STANDARDS FOR NEW AND NONOFFICIAL REMEDIES Catalogue of Tests and Standards for New and Nonofficial Remedies Which Standard Accepted by the Council on Pharmacy and Chemistry of the American Medical Association. July 1, 1953. Issued by the Chemical Laboratory, American Medical Association. 1953. 327 pages. J. B. Lippincott Co. Philadelphia, Pa. 1953. Price \$4.

For many years *New and Nonofficial Remedies* has been a valuable source of information on new drugs accepted by the American Medical Association Council on Pharmacy and Chemistry. A recent survey has shown that the physician and medical student find it valuable for its concise descriptions of the actions, dosage, and uses of new remedies while the pharmacist is interested chiefly in the physical descriptions, methods of assay, dosage forms, and tolerance limits of the same remedies. *Tests and Standards for New and Nonofficial Remedies* represents the separate publication of the material of pharmaceutical interest. This is a smaller, less expensive book, but its usefulness to the pharmacist and pharmaceutical chemist is unimpaired.

No textbook is revised frequently enough to keep up with the addition of new drugs and the Council has provided this annual means of bringing up to date the descriptions of those new drugs that have been submitted to it by pharmaceutical firms and found worthy of receiving its endorsement. Editing and compiling the monographs has been ably accomplished by Director Walter Wolman and his staff of the American Medical Association Chemical Laboratory. The result is a book essential to those in the pharmaceutical profession who must keep up with a rapidly changing field.—*Col P. H. Smith USAFR*

SURGICAL TECHNIQUE A Practical Guide to the Principles of Surgery by A. V. Parke and M. D. White. 10th edition. 704 pages. L. & F. B. Phillips. Philadelphia, Pa. 1953. Price \$15.

This is a thorough revision of an excellent book on general surgical techniques with emphasis on surgical anatomy. The authors describe their own techniques in which they are thoroughly familiar. It is illustrated with excellent drawings showing details of anatomy and surgical procedures. Other aspects of surgery are not covered. The material is rather elementary and basic, making excellent reading for a resident beginning in surgery. There are short chapters on chest, vascular, and plastic surgery and excellent presentations on fluid therapy, sutures, and their use, and abdominal incisions. References and study questions are included after many chapters.

Unfortunately, several of the operations described in detail are obsolete. The local excision of duodenal ulcer, closed intestinal anastomosis, crushing method of colostomy closure, and open drainage of lung abscess are emphasized, and the impression given that they are frequently done.

—*Lt. Col. R. M. Hardaway III MC USA*

THE TROUBLED MIND A Psychiatric Study of Success and Failure in Human Adaptation by Beulah Chamberlain Bosselman, M.D. 206 pages
The Ronald Press Co. New York N.Y. 1953 Price \$3.50

The author has met an unsatisfied demand from educators, religious groups, and informed laymen for an authoritative exposition of current thinking in psychiatry by describing personality as a process of success or failure in human adaptation.

The subject matter is presented under three main headings. First, successful adaptation is described from infancy and childhood through senility. This section describes clearly the process of personality development. In the second section, failure of adaptation is examined and its manifestations as neurosis and psychosis are discussed. This discussion would not satisfy a worker in the field, but is adequate for lay groups. In the final section, the author introduces a number of concepts of psychiatric treatment. This section is marred by an overcomprehensive approach. The attempt to group under one section such diversified subjects as dream interpretation, free association, responsibility of parents and techniques of psychotherapy, is less successful.

Under suggestions for further reading the author lists about 100 books, many of which are too technical for most readers. The book as a whole fulfills its purpose and is recommended for those who work with people. —*Major J. F. Donoran MC USA*

PHYSICAL MEDICINE AND REHABILITATION edited by Basil Kerner
M.B.B.S.D. Phys. Med. 610 pages illustrated Charles C. Thomas
Publisher Springfield Ill. 1953 Price \$12.75

This textbook has been written primarily for and will be of interest to the clinician who wishes to employ physical methods in diagnosis and treatment. The basic principles have been presented and their relationship to the various specialties in medicine has been integrated so that the reader will have a better understanding of the physical methods used in his own particular field.

The book may be divided into two sections. The first is primarily concerned with the basic sciences as related to physical medicine and rehabilitation. Such topics as functional anatomy, applied physiology, and physical methods used in diagnosis and treatment of neuromuscular disorders are discussed. In the second section the clinical application of the specialty is presented. Such fields as the rehabilitation of the injured, the paraplegic, the arthritic and the geriatric patient are covered. In addition there are chapters on vocational rehabilitation, and treatment of the patient with mental illness. Such fields as the rehabilitation of the injured, the paraplegic, the arthritic and the geriatric patient are covered. In addition there are chapters on vocational rehabilitation, and treatment of the patient with mental illness. Such fields as the rehabilitation of the injured, the paraplegic, the arthritic and the geriatric patient are covered. In addition there are chapters on vocational rehabilitation, and treatment of the patient with mental illness.

The various chapters in the book indicate clearly the breadth and scope of physical medicine and emphasize the thorough training necessary for success in this specialty

—Lt Col R C Psaki MC USA

EXPERIMENTAL ATHEROSCLEROSIS by L is N Katz M D d j
m b Staml M D 375 pag s 46 illustrat on 84 tables Charl C
Th ma P bli h Spr ngf ld Ill 1953 Pr c \$10 50

The field of research in certain subjects has become so large and the number of papers so great that the appearance from time to time of a review monograph is very helpful. The reader of such a monograph, however, must be on his guard against certain failings of such works which are inherent in them. As a rule the authors are notable in the field for research and teaching. Unavoidably their opinion and the trend of their particular investigations may be at variance with other authorities. If the reader keeps this in mind and is sufficiently familiar with the work of other eminent men in the field then he can read such a book with profit.

In the opening chapter these authors define their terms and indicate their own opinions relative to the pathogenesis of atherosclerosis. Next they discuss the large amount of information on human atherosclerosis, the apparent effects of diet, disease, and race on this condition. They consider the low fat low cholesterol diet in humans and indicate that considerable further work must be done before the details of the relationship can be ascertained. The authors make one critical point, namely that the actual blood levels of cholesterol may not be as important as the quantity that the body must transport, turn over and metabolize.

In a discussion of atherosclerosis and the plasma lipoprotein complex, present knowledge is summarized and modes of investigation outlined that may be used in the future. A long chapter is devoted to experimental atherosclerosis. The authors state that the literature on experimental atherosclerosis is not completely covered, rather the senior author's ten years' experience, principally using chicks as an experimental animal. However, the results of many other investigators are described and commented on. In the concluding chapter the authors very briefly summarize their opinion and their expectations for the future.

This book is well organized and contains a total of 713 references. The tables and graphs are simple but effective, and the descriptions of experimental work are adequate. Those engaged in experimental work should consult the original papers for methods. This book is recommended to the many physicians who are interested in the atherosclerosis problem but who are not engaged in its investigation.—Comdr R C Parker Jr MC USN

PSYCHOTHERAPY Theory d R rch by O H b t Mow Ph D d
 21 ontr butors 700 pages Illustrat d Th Ronald P e Co N w
 Yo k N Y publ h r 1953

This volume on psychotherapy is arranged in the form of a symposium divided into two major sections and the various contributions are written by psychologists who are prominent in the field of clinical investigation and research

The first section is devoted to the theory, concepts and application of psychotherapy There is an inevitable overlapping of the subject material as each writer defines his concept and objectives of psychotherapy All are in agreement, however, in considering psychotherapy as a learning process which attempts to free the patient from the ineffective or inhibiting behavioral patterns of the past so that he can more fully know himself as a person and thus lead a more effective and satisfactory existence Emphasis is placed on the cultural causes for anxiety A position contrary to the Freudian concept of neurosis is presented The view that psychotherapy is conceived as a resocialization process by which the patient learns a new comfort reaction to replace his anxiety reaction to his own impulses is reiterated

The second section reports research in methods and results of psychotherapy Research is described which correlates the progress of psychotherapy in patients as indicated by their anxiety or tension This involves the principle of sorting palmar sweating and several physiologic changes measured by the lie detector The results obtained seem to warrant preliminary favorable conclusions

While this book is verbose and repetitious in parts and the statistical results are difficult to follow it is thought-provoking indicative of fresh and realistic viewpoints and reports research methods which have promise For these reasons it is highly recommended to psychiatrists interested in psychotherapy particularly because the concepts and findings of the psychologist in this field are seldom encountered in the usual psychiatric journals and texts —Col A J Glass MC USA

THE PHYSICS OF RADIATION THERAPY by H ld Ell d J bn M A
 Ph D edit d by M lton F dma M D 286 pag Illustrated Charl
 C Thoma P bl h Sp gf eld Ill 1953 P c \$8 50

This textbook on physics of radiation therapy presents the subject matter in a logical interesting concise manner and complete enough for the needs of the practicing radiotherapist The early chapters discuss the basic physics of atomic and electromagnetic radiations in a way that will provide residents in radiology with a solid foundation for their clinical work in radiation therapy The figures and graphs add clarity to the subject matter The chapters on radiation distribution and energy absorption are

very thought provoking and are presented from the standpoint of clinical practice of radiation therapy. Two chapters are devoted to the properties and use of radium. A few examples of multiple field techniques and clinical applications of radium which point out the basic principles of these methods of therapy are given. A chapter on high energy devices and artificial radioactivity covers the basic physics of these agents. The appendix contains commonly used depth dose tables and isodose curves.

This book is highly recommended especially for residents in radiation therapy —*Col R J Healy MC USA*

TEXTBOOK OF COLLEGE HYGIENE by Olive E Byrd Ed D M D 443 pages illustrated W B Saunders Co Philadelphia Pa 1953

The preface states that the book is based on the health interests and the health needs of a large number of college undergraduates. It contains 30 chapters covering such subjects as health in marriage, pregnancy and childbirth, infant and child care, mental health and emotional problems, nutrition, overweight, alcohol and narcotics, care of the eyes, care of the teeth, communicable diseases, immunizations, high blood pressure, heart disease, cancer, and accidents. Each chapter is followed by five questions and several references for additional reading. In the Teacher's Manual, which can be procured with the book, the author states that "the textbook can be a foundation for the entire course or it may be considered strictly as a supplement." It would probably best serve the latter purpose because the subjects covered do not constitute a well rounded course in college hygiene.

The book's chief defect is that such fundamentals of hygiene as anatomy, physiology, and immunology have been neglected in favor of the "functional and public health approach." The chapters on mental and emotional problems are judged the best in the book and deserve more coverage than the 40 pages given them. Twenty percent of the text is devoted to alcohol, tobacco, and narcotics, but first aid for traumatic injuries and other common emergencies is hardly mentioned. Some of the information is too detailed or technical for the average college student. It is doubtful if he will profit anything by knowing that "paraldehyde, hyoscine, hydrobromide chloral hydrate, sodium bromide are effective in relieving the acute symptoms of mentally ill patients," that "dibenamine reverses the exciting effect of adrenalin," or that "the FPM or filter paper microscopic test and the Chediak blood test are examples of the newer tests for syphilis."

In general the book will serve as a compact ready source for collateral reading for a college hygiene course. It, however, gives the impression of having been hurriedly assembled and written —*Col H A Schulze USAF (MC)*

BACTERIAL GENETICS by W m B Ph D 238 p g Il trat d W B
Saunde s Co Ph ladelphia P 1953 P \$6 50

This book presents the important principles of bacterial genetics and provides a basis for evaluation of the relationship between this comparatively new field and certain aspects of applied bacteriology. Instead of attempting an exhaustive bibliography the author uses a limited number of references to direct the reader to the important aspects of bacterial genetics and as a guidance to other pertinent publications.

The text is divided into 13 chapters under headings that follow an orderly development of the subject matter from a description of fundamental genetic principles to a discussion of the relationship between bacterial genetics and certain general bacteriologic problems. Most of the essential concepts concerned with bacterial genetics are given consideration adequate for beginners in the field. The book provides concise well presented information which represents achievement of the objectives set forth by the author.

The volume is attractively bound and contains an informative table of contents and a useful index. This outline of bacterial genetics should serve well in providing a background for students and a reference source for seasoned investigators.

—Comdr L A Barnes MSC USN

MANUAL OF MEDICAL EMERGENCIES by Stua t C. Cull n, M D a d E G
Gro M D 2d d t o 278 p g Il trat d Th Y ar Bo k P b
I he I Ch c g Ill 1953 P \$4 50

This is a new edition of a pocket-sized well organized volume which deals comprehensively with the principal medical emergencies. It is clearly written and has an excellent format. The authors present broad physiologic concepts of management on rational and common-sense basis and show admirable restraint in not permitting the text to become overly detailed. The chapters on "Airway and Artificial Respiration" and on "Oxygen Therapy" and the recurring emphases on these topics throughout the volume are of particular value. The chapter on "Head Injuries" is a masterpiece in its development of a logical, physiologic and sequential approach to this common and frequently mishandled emergency. A series of well drawn and amusing cartoons impressively delineates the management of local anesthetic drug reactions and should be of particular interest to dentists. The use of the newer preparations such as n allylnormorphine vitamin k and norepinephrine is adequately covered.

This volume is highly recommended as standard equipment in the physician's bag and would provide a most useful adjunct to the equipment in the receiving ward of every dispensary and hospital —Lt Comdr R A Mozon MC USN

to student officers and staff planners responsible for integration of the potent new atomic weapons into the tactical doctrine of the Army. It is a valuable orientation study for all military and civilian personnel concerned with offensive and defensive aspects of atomic warfare — *Col J H Talbot USAF (MC)*

INTRODUCTION TO PHYSIOLOGICAL AND PATHOLOGICAL CHEMISTRY

by L. E. I. Arnow Ph G B S Ph D M B M D R d w t h
s t of M r i C. D A d d R N B S 4th d t 508 p g s
I l t r a t d Th C. V M by Co St Lo s M 1953 P r c e \$ 3 75
INTRODUCTION TO LABORATORY CHEMISTRY by L. E. I. Arnow
Ph G B S Ph D M B M D R e d w t h t c f
M a C. D A d R N B S 4th d t 108 p g e s I l t e d
Th C V M by Co St Lo M 1953 P r c \$ 1 50

Chapters on atomic energy the chemistry of blood and the periodic table have been added to the new fourth edition of this well known chemistry text for student nurses. Laboratory experiments have been deleted from the present edition and now constitute a small separate volume entitled *Introduction to Laboratory Chemistry*. Less than half of the text is devoted to a fundamental treatment of inorganic and organic chemistry intended to equip the student with information indispensable to an understanding of the author's subsequent presentation of selected facts and relationships in physiologic and pathologic chemistry. The chapters on inorganic and organic chemistry are written in a manner consistent with the needs of students who have not taken a secondary school course in chemistry.

The balance of the text concentrates on those facts and understandings in physiologic and pathologic chemistry which can be expected to be of importance to the practicing nurse. The discussion of the nature and intermediary metabolism of lipids carbohydrates proteins and minerals and the chemistry of the digestive tract hormones vitamins and nutrition is consistent with the nurse's practical needs. The chapters on blood and urine are effectively written. Typical laboratory findings generally associated with a broad spectrum of well defined clinical states are presented with clarity and appropriateness. In this respect the text promises to serve the student nurse as a valuable reference long after graduation.

The laboratory manual includes 144 discrete experiments which provide the student and instructor alike with a wide selection of laboratory learning experiences designed to parallel the material presented in the text. All of the experiments would appear to be within the scope of students with no prior course in chemistry. Those experiments which are intended as demonstrations are clearly indicated.

— *Lt Col T J Domanski USAF (MSC)*

A HISTORY OF PSYCHOANALYSIS IN AMERICA by C F Oberholser M D
280 pages Grune & Stratton Inc New York N Y 1953 Price \$5

This book, written from a personal background, is an account of the development of psychoanalytic psychiatry and its practice in America, from its first serious clinical application in the Manhattan State Hospital in 1909. The first two chapters give an account of the precursors of Freud's thinking in Europe and the anticipation of his thinking among novelists and other writers. These serve as a background for the introduction of psychoanalytic theory in America, culminating in the wide validation of psychoanalysis after Freud delivered a series of five lectures "On Psychoanalysis" at Clark University in September 1909.

Thereafter, the book assumes a more personal aspect as the author traces the trials and tribulations of psychoanalysis, both as a science and art, through his experiences as an active and leading participant in psychoanalytic affairs for more than 40 years. The author has fulfilled his purpose of presenting "in interesting narrative form the main facts of the development of psychoanalysis as I have seen them during this period and shall add only such details about myself as are necessary to enable the listener to have some idea of the background and preparation and outstanding tastes of the persons through whom the story is presented."

The book furnishes interesting and informative reading, not only for psychoanalysts and analytically oriented psychiatrists, but also for the many others in related branches of medicine and science whose lives have been changed and enriched through the application of Freud's discoveries.

—Lt Col A L Brown MC, USA

COMPRESSION ARTHRODESIS Including Central Dislocation as a Principle in Hip Surgery by John Charnley F R C S 264 pages illustrated
The Williams & Wilkins Co Baltimore Md 1953 Price \$8.50

This monograph is a vigorous exposition of the author's theories on compression arthrodesis, namely that in the healing of cancellous bone maximum osteogenesis takes place at the site of maximum pressure. A distinction is made between the healing of cancellous bone and cortical bone, and most of a chapter is spent in refuting Eggers' work on the concept of a "contact compression factor" in the healing of fractures in cortical bone. Another chapter is devoted to a rebuttal of Watson Jones' denunciation of the Charnley theory of the use of mechanical compression in osseous union.

Nevertheless the book makes interesting reading. It is well written and the illustrations are excellent. The technic of compression arthrodesis of all the major joints is described in detail and illustrative case histories are given. The author's experience

PREGNANCY WASTAGE Proceeding of a Conference Sponsored by the Committee on Human Reproduction, National Research Council, held at the National Committee on Maternal Health, 1953. Edited by Earl T. Engel. 254 pages. Illustrations. Charles C. Thomas, Publisher. Springfield, Ill. 1953. Price \$8.50.

HYPERTENSIVE DISEASES Caused and Controlled by Henry A. Schroder, M.D., F.A.C.P., Associate Professor of Medicine and Director, Hypertension Division, Department of Internal Medicine, Washington University School of Medicine, Assistant Physician, Barnes Hospital. St. Louis, Mo. With Contributions from Gregory S. G. and M.D. Dea F. Da. Ph.D. M.D. H. Mitchell Perry, J. M.D. D. R. F. G. B. M. B. Ch. B. M. R. C. P. (Ed.). 610 pages. 164 illustrations. 3 color plates. L. & F. B. G. T. Philadelphia, Pa. 1953. Price \$10.

SURGERY OF REPAIR AS APPLIED TO HAND INJURIES by B. K. R. N. M. S. (Melbourne), F.R.C.S. (England), F.R.A.C.S. (Honorary), Plastic Surgeon, Royal Melbourne Hospital, Victoria, Australia. Plastic Surgeon, Ministry of Health, Tasmania. and A. R. W. K. J. M. S. (Melbourne), F.R.C.S. (England), F.R.A.C.S. (Honorary), Plastic Surgeon, Children's Hospital, Melbourne. Honorary Assistant Plastic Surgeon, Royal Melbourne Hospital, Victoria. Plastic Surgeon, Registrar, Commonwealth, or For word by Sir Godfrey D. N. Taylor, K.B.E., C.B., LL.D., Sc.D., F.R.C.S., F.R.C.S. (Ed.), F.R.A.C.S., F.A.C.S., F.R.C.S. (Canada). 256 pages. Illustrated. Thomas, Willmott & Walker, Cambridge, Mass. 1953. Price \$8.

PLANNING GUIDE FOR RADIOLOGIC INSTALLATIONS by the Committee on Planning of Radiology Facilities of the Committee on Public Relations of the American College of Radiology and the American College of Roentgenology. 336 pages. Illustrated. The Year Book Publishers, Inc., Chicago, Ill. 1953. Price \$8.

THE YEAR BOOK OF PEDIATRICS (1953-1954 Year Book Series) edited by Sydney S. Gillis, M.D., Assistant Professor of Pediatrics, Harvard Medical School, Senior Physician, Children's Medical Center, Boston, P. D. T. in the Child's Health International Board, for the American Medical Association. 435 pages. Illustrated. The Year Book Publishers, Inc., Chicago, Ill. 1953. Price \$6.

HYPNOTISM: AN OBJECTIVE STUDY IN SUGGESTIBILITY by A. D. M. W. T. N. 380 pages. John Wiley & Sons, Inc., New York, N. Y. 1953. Price \$6.

RESUSCITATION OF THE NEWBORN by Joseph D. Russett, M.D., F.A.A.P., Assistant Professor of Pediatrics, Tulane University School of Medicine, Senior Pediatric Tour Lecturer, New Orleans, La. American Lecture Series (R) Publication Number 193. American Lecture Series. Author. Illustrated by Job Adams, M.D., Director, Department of Anesthesiology, Children's Hospital, New Orleans, La. 55 pages. Illustrated. Charles C. Thomas, Publisher, Springfield, Ill. 1953. Price \$2.50.

PHYSIOLOGICAL CARDIOLOGY by Arthur Russek, M.D., F.A.C.P., Associate Professor of Internal Medicine, University of Medicine and Branch General Internal Medicine, Lecturer Series (R) Publication Number 184. American Lecture Series. The Bureau of Diseases of American Physiological Society. Illustrated by Robert F. Pitt, M.D., Ph.D., Professor of Physiology and Biophysics, Cornell University, Medical College, New York, N. Y. 370 pages. Illustrated. Charles C. Thomas, Publisher, Springfield, Ill. 1953. Price \$8.

THE DISPOSAL OF THE DEAD by *C. J. Polson* M D (Burr) F R C P (Lond) Barrister-at Law Professor of Forensic Medicine University of Leeds *R. P. Bittain* M A B Sc M B., Ch B B L LL B (Glasgow) Senior Lecturer in Forensic Medicine University of Leeds and *T. A. Marshall* M B Ch B (Leeds) Lecturer in Forensic Medicine University of Leeds Edited by *C. J. Polson*. 300 pages Philosophical Library Inc New York N Y 1953 Price \$7 50

DISEASES OF WOMEN by *Robert James Cossen* A B M D F A C S Assistant Professor of Clinical Gynecology and Obstetrics Washington University School of Medicine Section Head of Unit I Obstetrics and Gynecology St Louis City Hospital Assistant Gynecologist and Obstetrician to Barnes Hospital and St Louis Maternity Hospital Assistant Gynecologist to St Louis Children's Hospital Gynecologist and Obstetrician to St Luke's Hospital Member of American Academy of Obstetrics and Gynecology Central Association of Obstetricians and Gynecologists American Radium Society American Society for the Study of Sterility International Fertility Association Diplomate of the American Board of Obstetrics and Gynecology 10th edition 935 pages 990 illustrations including 41 in color The C V Mosby Co St Louis Mo 1953 Price \$18 50

THE DIGESTIVE TRACT IN ROENTGENOLOGY Volumes I and II by *Jacob Buckstein* M D Assistant Professor of Clinical Medicine Cornell University Medical College Visiting Roentgenologist (Alimentary Tract Division) Bellevue Hospital New York N Y Attending Gastroenterologist Beth David Hospital New York N Y Consultant to the Central Islip State Hospital New York orwalk General Hospital Norwalk Conn Good Samaritan Hospital Suffern N Y Formerly Consultant in Gastroenterology to the U S Public Health Service and the U S Veterans Bureau 2d edition Volume I 544 pages Volume II 658 pages 1534 illustrations in 897 figures J B Lippincott Co Philadelphia Pa 1953 Price \$30 set

MOTHER AND BABY CARE IN PICTURES by *Louise Zabruskie* R N Director Maternity Consultation Service New York N Y Formerly Lecturer New York University Night Supervisor Lying in Hospital New York N Y Field Director Maternity Center Association New York N Y 4th edition 244 pages 255 figure numbers and 11 tables J B Lippincott Co Philadelphia Pa 1953 Price \$3

REVIEW OF PHYSIOLOGICAL CHEMISTRY by *Haold A Harpe* Ph D Professor of Biochemistry University of San Francisco Lecturer in Surgery University of California School of Medicine San Francisco Biochemist Consultant to Metabolic Research Facility U S Naval Hospital Oakland Biochemist Consultant to St Mary's Hospital San Francisco 4th edition 328 pages illustrated Lange Medical Publications University of Medical Publishers P O Box 1215 Los Altos Calif 1953 Price \$4

NASH'S SURGICAL PHYSIOLOGY New Second Edition The first edition was written by *Joseph Nash* M D Late Assistant Professor of Clinical Surgery New York University College of Medicine Associate Visiting Surgeon Bellevue Hospital New York N Y the second edition was revised and edited by *Brian Blades* M D Professor of Surgery George Washington University School of Medicine with the collaboration of *Eduard J Beattie* J M D *Leon Gebe* M D *Walter H Gerug Jr* M D *Ernest A Gould* M D *Alec Horuit* M D *Vincent M Iovine* M D *Gordon Lettman* M D *William S McCun* M D *William C Meloy* M D *Hugo V Rizzoli* M D and *Jacob J Weinstein* M D all of The George Washington University School of Medicine 686 pages illustrated Charles C Thomas Publisher Springfield Ill 1953 Price \$12 50

FRONTAL LOBES AND SCHIZOPHRENIA Sec nd L b tomy Proj ct of Do to Psych p th Hospit l dited by Mlt G blatt M D A st Cl i l P ofea or Psych try Hrv d M d l S ho l nd Ch f of Labor tor d Re tch B to Pay hopathic H pt l d H rry C. Solom M D P of sor of Psych ry H rvard Med l School and M d c l Dure tor B ton P ych p th c H pt l 425 pag ll tr t d Spr ge P bl hng Co l c New York N Y 1953 Price \$12 50

AUTOPSY DIAGNOSIS OF CONGENITALLY MALFORMED HEARTS by Maur c L v M D P th log st nd Ch f of Re e ch Labor torie M t S nst H pt l f M m M m B h Fla Associ te Prof s o f P th logy U r ty f M m Sch l of M d Co al G bl Fl Fo merly Assoc t Prof sor of P th l gy U v r s ty of Il l o s College f Medic n Ch c go Ill Formerly A sist t P fes or f Pathology Cr ighton U r ty S h ol of M d c Omah N br 194 p ges ill t r d Charl C Th mas P bl her Spr gfeld Ill 1953 Pr ce \$7 50

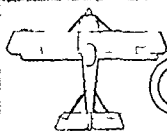
THE GREEN AND RED PLANET A Phy iol g cal St dy of th P s b l ty f L f MARS by Hub t Strugh ld Pr f sor f A to M d c n H d f Dep tme t of Spa M d c ne U S Ar For School of A ia t on M d c ne w th editorial it c d a forew d by G n P yton. 107 pag illu str ted The U t s ty f N w M co Pr s Alb q qu N w M 1953 P ic \$4

THE YEAR BOOK OF RADIOLOGY (1953 1954 Y ar B k S r es) Rad ologic D gos edited by J b Flyd H llt M D As oc at P ofe sor Dep tme t of Roe tge logy U r ty of Mich g nd F d J e ne Hodg M D Pr f or nd Chairman Dep tme t of Roe tgenology U r ty f M ch g R d t on The py edit d by H ld J ax M D P f s or of Rad ol gy Coll g f Physic s and Surgeons C lmbia U s ty Ch f R d t on The py D t R d l g c Serv e Pesbyt H pt l N w York N Y d V n t P C H s M D P f sor nd Ch man D partme t f R d ol gy Bylor U r ty C ll ge of M d c R d l g st -Ch f J lfer Da i Hospit l H u ton T 462 p g ll tr t d Th Y Book P bl sher Inc Ch go Ill 1953 P \$8

GROWTH OF PROTOZOA by S H H t d W llt m T g Org nally p bl h ed i A l of the N w York A d my of Sc ce Vol me 56 At l 5 p g 815 1094 Octobe 14 1953 illu tr t d Th N w Yo k Ac d my of Sci ce New York N Y 1953 Pr \$4 50

THE RELATION OF LEAN BODY WEIGHT TO METABOLISM AND SOME CONSEQUENT SYSTEMATIZATIONS by Alb t R B b ke M d l R se ch L bor tor y U t d St te S bmarine B New Lon don C n Org nally publ h ed Ann l of the N w York Ac d my f Sc ence Vol me 56 Art le 6 pag s 1095 1142 Nov mber 17 1953 Ill t ted The N w York Ac demy of Scienc N w Y k N Y 1953 Pr ce \$1 25

THE PSYCHIATRIST HIS TRAINING AND DEVELOPMENT R port of th 1952 C nfer n Psychiatr Edu tion held t Cor ll U r ty lthac N Y June 19-25 1952 Orga d and onducted by the American Psych t c A soc ti d th A soci t of Amer a M d l Coll g Ed tor l Board J b C. W b t horn, M D Ch r man F J B el nd M D Ver W Lippa d M D nd W lliam Malamud M D Editorial A t St ell Bl b H R b t L. Rob nson. 214 pag ll strated Amer a Psych tr c A soc t n W hngton D C 1953



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**AEROMEDICAL
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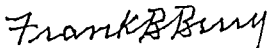
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Monthly Message

As I extend to all of you my greetings for our common work together the words of the dying King Arthur to his faithful knight come to mind. In Tennyson's *Passing of Arthur* Arthur says

The old order changeth yielding place to new

Although I succeed Dr. Casberg that is the only change. We of the medical profession within the armed services and without are deeply grateful to Melvin Casberg for all he has done for us. He has established friendly, warm and sincere rapport with all people and with all organizations with whom he has come in contact and after all organizations are merely people. He has impressed every one of us by his devotion to his task and his belief in truth and right. He has established a very firm foundation and wise policies and it is my hope that these may be furthered and developed to their fullest extent throughout the coming years. Although Dr. Casberg returns to private practice he will always be available to us for consultation and I know that Secretary Wilson and his associates, the Advisory Council and those of us in this office hope that he will actively participate as our mentor.



FRANK B. BERRY M.D.
Assistant Secretary of Defense
(Health and Medical)

PHEOCHROMOCYTOMA

Successful Surgical Removal in Two Patients

RALPH D ROSS *Commander MC USA*

ROBERT E MITCHELL *Lieutenant MC USN*

WILLIAM E LARSEN *Lieutenant MC USN (Ret)*

JAMES R DILLOV *Commander MC USA*

PHEOCHROMOCYTOMAS are tumors of unusual interest because the arterial hypertension caused by them can be completely alleviated. Pheochromocytomas are relatively rare tumors of chromaffin sympathetic nerve tissue, which are most often seen in the adrenal medulla or in one of the many areas where chromaffin tissue occurs, and which produce epinephrine and/or norepinephrine in abnormal quantities.

The symptoms associated with pheochromocytoma can be extremely varied and bizarre and may simulate many other diseases.¹⁻⁴ Crede and Herr⁵ observed that many patients with pheochromocytoma may have symptoms resembling those of acute anxiety attacks or other psychiatric disorders. The two patients reported in this article had both been given psychiatric diagnoses prior to the establishment of the exact nature of their disabilities. The usual symptoms produced by the tumor are the result of the secretion of an excess of the pressor substance, either continuously or intermittently. The action is metabolic as well as hemodynamic, according to Cahill and Aranow.⁷ The hemodynamic action is due primarily to a vasoconstriction of the peripheral arterioles with a resulting elevation of the blood pressure. The chief metabolic changes are increased blood glucose, blood lactic acid, and basal metabolic rate.⁷

Pheochromocytomas have been known to pathologists since 1886 when Frankel reported the autopsy findings of bilateral adrenal tumors and cardiac hypertrophy in an 18-year old girl, who had had attacks of palpitation, headaches and vomiting for three years.⁸ The clinical adrenosympathetic syndrome was first described by Labbe and associates in 1922, and since then pheochromocytomas have been recognized with increasing frequency. In 1927, Mayo⁹ reported the first successful surgical removal of such a tumor with cure of paroxysmal hypertension.

F m U S N val H p l Oakl d Calif Comdr Ross s ow at U S N I H s
p l Co na Calif

It is most important to perform indicated diagnostic procedures to rule out pheochromocytoma in all patients with hypertension especially when the explanation of the symptoms and the hypertension is not satisfactory. Failure to diagnose the presence of a pheochromocytoma usually results in a progressive hypertension progressive arterial disease and eventual fatal outcome. The prognosis in patients afflicted with a pheochromocytoma is invariably fatal if the tumor is not removed.¹ The hypertensive crises in those with a history of paroxysms become more and more severe until death results from a violent crisis. The cardiovascular changes in a patient with chronic hypertension due to pheochromocytoma may not cause death as soon as those that occur in the paroxysmal type.¹ The importance of recognition of these tumors lies in the fact that successful extirpation ordinarily results in alleviation of the hypertension and its attendant vascular disease. Diagnosis of the presence of this tumor presents only one aspect of the problem.² Various diagnostic tests have been developed which greatly aid in establishing the diagnosis.³ Accurate localization of the site of the tumor is necessary prior to surgery. Extraperitoneal pneumography as described by Steinbach and associates⁴ proved to be a very satisfactory technic in the two patients herein reported and the procedure produced no morbidity. Operative intervention and postoperative treatment presents many serious problems.^{5, 6, 7, 8}

Successful surgical intervention usually results in a complete remission of symptoms and a cure of the hypertension. The operative mortality is still high. Snyder and Vick⁹ reported a mortality rate of 22 percent in 58 patients operated on. More careful preoperative preparation, improved anesthesia and surgical technic as well as the use of pressor and adrenolytic drugs during and following surgical intervention have produced a more favorable prognosis in these patients as well as a decreased mortality rate.

The two patients reported in this paper were treated at this hospital and originally were described by Hood and Dickinson as cases 1 and 3 in discussing the surgical approach indicated.

CASE REPORTS

Case 1 A 49 year old man was admitted to this hospital on 27 December 1951 complaining of recurrent headaches dating back to 1943 and hemorrhage from the lungs of seven days duration. He had enjoyed good health prior to 1943. At the onset the headaches were generalized and usually persisted from one to four hours but on infrequent occasions lasted as long as 24 hours. The cephalgia would completely subside and he would be asymptomatic for three or four days. In 1944 he had a persistent headache of several months duration. At that time he was under

treatment for an acute sinusitis, and therapy directed toward this disability afforded only minimal relief. Following this the headaches again became recurrent in nature. In June 1951 the cephalgia became much more severe and consisted of daily episodes from 30 to 90 minutes in duration. Subsequent to June 1951 the headaches usually occurred at about 1000 each day and were often brought on by sudden changes in body position. Marked generalized weakness, a feeling of prostration and a profuse perspiration were associated with the episodes of headache.

In 1943 and 1944, while in the armed services, he was studied in order to determine the cause of the cephalgia and it was found that the blood pressure was elevated. He was subsequently discharged from the service in 1945 on the basis of arterial hypertension and anxiety reaction. Subsequent to 1945 he had been under the care of physicians almost continuously because of the recurrent headaches, joint symptoms and the elevated blood pressure. He was told on numerous occasions that the blood pressure was within normal limits, whereas on other occasions it was found to be as high as 240/135. He complained of mild dyspnea on strenuous exertion, but with the exception of the hemoptysis of bright red and frothy blood, which had been present for 7 days prior to his admission to the hospital, he denied other cardiovascular or respiratory symptoms. He had been treated for the hemoptysis in another hospital and he stated that he was "unconscious" most of that time.

His 73 year old mother had had hypertensive cardiovascular disease for many years.

The physical examination on admission revealed evidence of chronic illness and moderate pallor. The blood pressure was 142/92. Other physical examination findings were within normal limits.

An electrocardiogram taken on admission to the hospital showed T wave inversion (fig 1, before surgery). Blood glucose determinations were found to be normal, but during paroxysms of hypertension blood glucose was elevated as high as 296 mg per 100 cc. A benzodioxane test during a paroxysm of hypertension, using 17 mg of piperoxane hydrochloride (benodaine), produced a fall in blood pressure amounting to 110 mm Hg systolic and 55 mm Hg diastolic in 2 minutes. An oxygen insufflation in the retroperitoneal spaces demonstrated a 4 by 4.5 cm mass in the region above the superior pole of the right kidney (fig 2). The left kidney and suprarenal structures appeared normal on this study. The technic in this procedure was essentially as described by Steinbach and associates.²⁷ The patient was placed in the Sims position. A number 20-gauge spinal needle was inserted in the mid

cephalogram intravenous pyelograms, and skin tests for coccidioidomycosis and histoplasmosis were negative or within normal limits

The patient's course in the hospital was characterized by recurrent episodes of severe frontal headaches associated with profuse perspiration and generalized weakness. During these attacks his blood pressure was found to be markedly elevated to levels of over 300 mm Hg systolic and 170 mm Hg diastolic. The symptoms and paroxysms of hypertension usually persisted for from 30 to 90 minutes and often occurred at about 1000 each

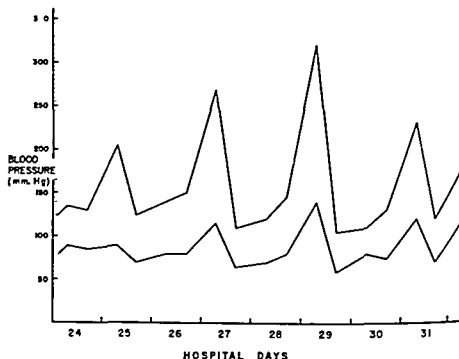


Fig 3 (case 1) Graph showing simple daily blood pressure level

day. The blood pressure between paroxysms was found to be from 110/70 to 140/80. Massage to the right renal area produced a paroxysm of hypertension with headache, perspiration, and weakness, whereas massage over the left renal area elicited no change in the blood pressure and no symptoms. There was marked variation in the blood pressure taken at specific hours each day (fig 3).

On 19 February 1952 the patient was started on cortisone 100 mg given intramuscularly twice daily for two days preoperatively and two days postoperatively, then 50 mg twice daily for three days, 25 mg twice daily for three days, then 25 mg daily for three days. On 21 February 1952 he was prepared for surgical

excision of the tumor, at which time his blood pressure was normal. Following induction anesthesia with thiopental sodium (pentothal) the blood pressure rose to 270/140. Benodaine given intravenously in a total dosage of 40 mg produced only a slight, transient decrease in the blood pressure levels. Five milligrams of phentolamine (regitine) was administered intramuscularly, and shortly thereafter there was a gradual decrease in the blood pressure to preinduction levels. A thoracoabdominal incision was

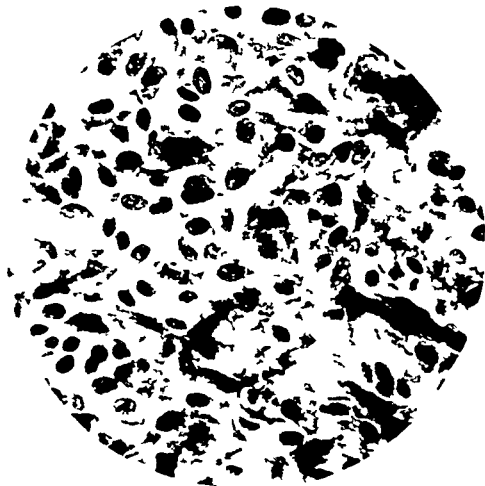


Fig re 4 (case 1) Photomicrograph of tumor tissue (X 645)

made over the ninth rib on the right. The pleural cavity was exposed and the lung was partially deflated and retracted away from the diaphragm as described by Hood and Dickinson.¹¹ The diaphragm was incised above the dome of the liver and the peritoneal cavity was entered. The liver was retracted medially, exposing the space between the liver and the upper pole of the kidney. The adrenal gland was readily identified. The cortical substance was stretched over and around a 4 cm spherical mass. The tumor was well encapsulated, soft, and reddish brown, with yellow brown nodules scattered diffusely over the surface. The

lesion was gently dissected from its bed. At the time the tumor was manipulated there was a transient rise in the blood pressure. Shortly before the tumor was clamped off and excised 1 norepinephrine (levophed) was administered intravenously using 4 cc in 1 000 cc of normal saline solution.² At the time the tumor was excised the blood pressure dropped to 76/40. With 1 norepinephrine the blood pressure was maintained at a level of around 95/50. After surgery 1 norepinephrine was continued intravenously at a slow rate for about 24 hours.

The patient's postoperative course was uneventful and his blood pressure stabilized at a level of 130/80. He had no recurrence of his preoperative symptoms and no recurrence of the paroxysmal hypertension. A histamine test was performed after surgery using 0.05 mg intravenously and there was no elevation in the blood pressure. Serial electrocardiograms revealed that the T waves returned to within normal limits after surgical intervention (fig. 1). The patient was discharged to his home on 5 March 1952 completely asymptomatic. At the time of this writing his blood pressure is normal and he is enjoying good health.

The tumor weighed 17 grams. Histopathologic examination was diagnostic of benign pheochromocytoma (fig. 4). The tumor was analyzed by paper partition chromatography and a modification of von Euler's colorimetric method by Goldenberg. It was found to contain norepinephrine in an amount of 7.62 mg per gram of tumor tissue and epinephrine 1.72 mg per gram of tumor tissue.

Case 2. A 45 year old man was admitted to the hospital on 16 April 1952 because of nausea, vomiting, headache, and dizziness. He had had recurrent gastrointestinal symptoms since 1936 which usually consisted of pain in the abdomen, nausea, and vomiting, and were usually relieved by rest and by antacids. He was first admitted in 1945, but all findings of the upper gastrointestinal tract were negative at that time. In 1947, during a recurrence of his symptoms, he was admitted for suspected duodenal ulcer. His symptoms subsided in two months and he remained relatively well for seven months, but subsequently required several short periods of hospitalization because of recurrences. Beginning in 1949 he had severe recurrent frontal and bitemporal headaches associated with weakness, pallor, nausea, and vomiting. These episodes tended to recur about once each month and would persist for from 30 minutes to two hours. From early 1950 until July 1951 he noted a progressive increase in the frequency of these symptoms. After July 1951 he had an episode each day, usually coming on at 1030 and lasting from 30 minutes to two hours. Body position and activity had no relation to his complaints. On numerous occasions during recurrences he noted blood streaks with the emesis and black tarry stools. During a

previous period of hospitalization he was given an injection of histamine for a gastric analysis. This was followed by a violent reaction, characterized by headache, nausea, vomiting, extreme weakness, and syncope.

The physical examination at the time of his admission revealed an acutely ill, poorly nourished male. He appeared lethargic and there was moderate pallor. The blood pressure was 130/84 and the apical rate was 110 per minute. There was evidence of minimal cardiac enlargement to the left. Examination of the abdomen showed mild tenderness on deep palpation in the epigastric area. The lower pole of the right kidney could be palpated on deep

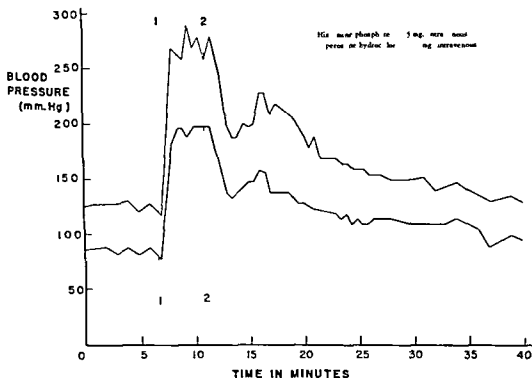


Figure 5 (case 2) Histamine and benzodioxane tests.

inspiration. The remainder of the physical examination was not contributory.

An electrocardiogram revealed definite T wave abnormalities. There were marked T wave changes as compared with a tracing taken in August 1951. A Fishberg concentration test showed a maximum specific gravity of 1.012. A urinalysis showed an albuminuria amounting to 300 mg per 100 cc. Nonprotein nitrogen was 42 mg per 100 cc. A histamine test was performed, using 0.025 mg intravenously, with a resulting elevation of the blood pressure from a level of 130/80 to 290/200 (fig 5). Six minutes after the injection of the histamine, 18 mg of piperoxane hydrochloride were given intravenously. This resulted in a drop in the blood pressure from 280/200 to 190/130 in a period of three

minutes (fig 5) Following the administration of histamine he developed a paroxysmal ventricular tachycardia, which persisted for five minutes then subsided without specific therapy Blood glucose determinations during paroxysms of hypertension were as high as 145 mg per 100 cc By injecting 1 100 cc of oxygen an extraperitoneal pneumogram was made using the same technic



Fig 6 (ca) Ext peritoneal p m gram show g i mor ma s i the
ght pra na la

as in case 1 This study showed the presence of a tumor mass in the right suprarenal area (fig 6) All other indicated laboratory procedures and special examinations, including a blood Kahn test complete blood count erythrocyte sedimentation rate fundoscopic examination blood cholesterol determination roentgenogram of the chest upper gastrointestinal roentgenographic series and intravenous pyelograms were negative or within normal limits

On the date of the patient's admission to the hospital, headache, syncope, nausea, vomiting, weakness, and pallor recurred and his blood pressure was found to be 270/170 and the apical rate 180 per minute. In the course of the next several days he developed numerous episodes of paroxysmal hypertension during which electrocardiograms showed a change in rhythm from a normal sinus mechanism to a nodal rhythm, with runs of auriculo-ventricular dissociation.

The patient was scheduled for surgical removal of the tumor on 8 May 1952. On 3 May 1952 quinidine therapy was started for the

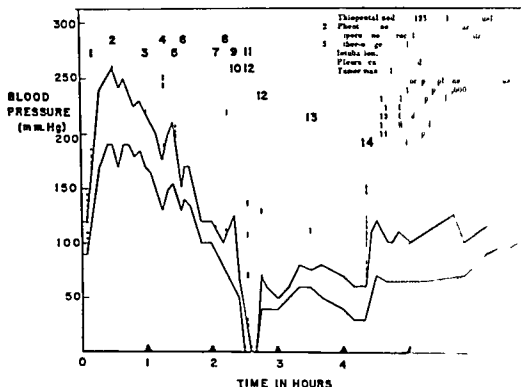


Figure 7 (case 2) Graph showing operative and postoperative levels with administration of various drugs.

prevention and control of his cardiac arrhythmia intramuscular cortisone was begun in a dosage of 50 mg daily for two days preoperatively and 25 mg daily then 50 mg twice daily for two days, 25 mg daily, and 25 mg daily for two days. He was given tolamine intramuscularly before being taken to the operating room. At that time his blood pressure varied from 130/90 to 140/90. Induction of anesthesia with sodium was begun and the blood pressure fell to 100/60. Additional 5 mg of phentolamine were given and there was no appreciable change in the blood pressure. 100 milligrams of piperoxane hydrochloride were given.

the blood pressure only slightly (fig 7) and it gradually returned to relatively normal levels after 75 minutes. At that time a thoracoabdominal incision was made using essentially the same technic as in case 1. The tumor was readily palpable when the diaphragm was opened and resection was accomplished. The tumor measured 6 by 4.5 by 4.5 cm. Upon removing it the blood pressure dropped to unobtainable levels. The electrocardiogram showed a cardiac arrest. The pericardium was opened and the

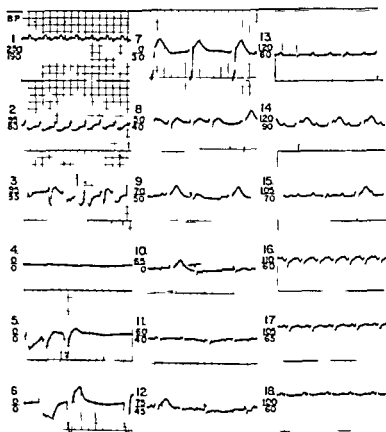


Fig 8 (ca 2) Electrocardiograms (lead II) during operation showing the arrhythmia which developed.

heart action was found to be arrested. Cardiac massage was promptly instituted and 0.5 cc of 1:1,000 epinephrine was injected into the heart. After five minutes a second intracardiac injection of epinephrine was made following which the heart began to beat at a rate of 40 to 50 per minute. Sixteen minutes lapsed before the blood pressure rose significantly. Intravenous administration of 1 norepinephrine in the concentration of 16 cc per 1,000 cc of fluids (fig 7) was started at a rapid rate immediately before the pedicle was clamped and was continued for about 48 hours postoperatively for maintenance of blood pressure. Post-

operatively he was given epinephrine in oil intramuscularly every two hours. The blood pressure gradually became stable at normal levels.

Electrocardiographic tracings taken continuously during surgery revealed the cardiac arrest described above and, in addition, showed numerous types of cardiac arrhythmias, including sinus tachycardia, nodal rhythm, auriculoventricular dissociation, paroxysmal ventricular tachycardia, numerous ectopic beats (multifocal ventricular nodal, and auricular in origin) and in complete and complete auriculoventricular block (fig. 8).

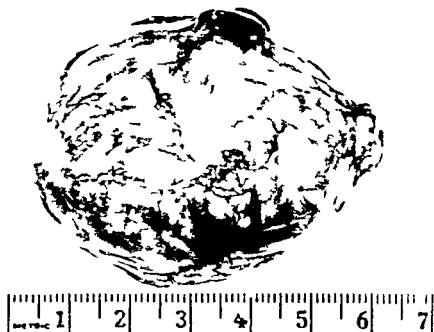


Figure 9 (case 2) Photograph of tumor

After the second postoperative day the patient's course was uneventful. There was no evidence of damage to the central nervous system from the cardiac arrest and hypotension. His blood pressure remained at normal levels and he had no recurrence of symptoms. Serial postoperative electrocardiograms showed a return to normal of the previously abnormal T waves and a histamine test using 0.05 mg intravenously, was negative.

The tumor weighed 65 grams and had essentially the same gross characteristics as that described in case 1 (fig. 9). The histopathologic picture was that of a benign pheochromocytoma (fig. 10). The tumor was analyzed by paper partition chromatography and a modification of von Euler's colorimetric method by Goldenberg²² and was found to contain norepinephrine in an amount of 7.3 mg per gram of tumor tissue and epinephrine 3.2 mg per gram of tumor tissue.

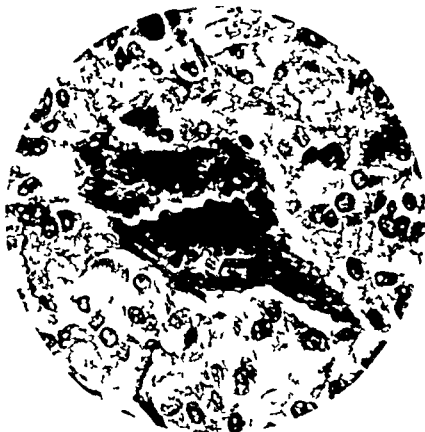


Fig. 10 (ca. 2) Photomicrograph of tumor tissue ($\times 645$)

A 24 hour urine specimen collected before the tumor was surgically removed was found to contain a mixture of epinephrine and norepinephrine equivalent to 1100 μg of norepinephrine

DISCUSSION

The symptomatology associated with pheochromocytoma may be extremely varied and bizarre and the clinical syndrome may simulate many other disease processes. The usual symptoms have been well documented in the literature. The disease does not always appear in a paroxysmal form and the blood pressure may be sustained for several weeks. When paroxysms occur they vary in duration, frequency, and intensity, persisting for a few minutes to many hours. The episodes usually increase in frequency as well as severity. Between attacks the patient is usually healthy, but the prognosis in patients with a pheochromocytoma is fatal if the tumor is not removed.

Examination of the patient during an attack is very helpful in establishing the diagnosis. The histamine test described by Roth

and kvale¹⁵ is often used. The drug is administered rapidly intravenously in an amount of 0.025 to 0.05 mg. In the normal person it usually produces little effect, but in the presence of a pheochromocytoma it may cause a severe paroxysm of hypertension. In case 2 herein reported the reaction to the test was positive before surgical removal of the tumor and became negative after the pheochromocytoma was removed. Following the preoperative administration of the drug in case 2 there developed a paroxysmal ventricular tachycardia, which subsided without specific therapy. In case 1 the reaction to the histamine test was negative following successful surgical removal of the tumor but the test was not conducted before operation. Another test used for the establishment of the diagnosis is the benzodioxane test.¹⁶ This procedure is not without some danger and is being replaced by the regitine test in many clinics. During a paroxysm of hypertension or in a patient with sustained hypertension, a calculated dosage of piperoxane hydrochloride is injected intravenously. In a person with a pheochromocytoma there is a definite drop in the systolic as well as diastolic blood pressure. In the two cases herein reported, piperoxane hydrochloride was used and the reaction to the test was positive in each case prior to operation. Massage over the right renal area produced symptoms and a paroxysm of hypertension in one of the patients reported in this article. The use of extraperitoneal pneumography as described by Steinbach and associates is an extremely valuable aid in localizing the tumor. This retroperitoneal oxygen insufflation technic is an important step forward in that tumors are readily demonstrated in the renal and adrenal areas. This procedure is accomplished painlessly, safely, and without morbidity to the patient. The results are consistently good. The technic is far superior to the older method of perirenal insufflation which was associated with a high morbidity and mortality rate. The resulting roentgenographic studies by this older technic were often of inferior quality and lacking in diagnostic details. In the two patients herein presented the tumors were well localized and outlined by the extraperitoneal oxygen pneumographic studies (figs. 2 and 6).

The treatment of pheochromocytoma is surgical excision. Operation is not without danger and the mortality rate for the procedure is still high. Paroxysmal cardiac arrhythmias, including ventricular tachycardia and fibrillation, are prone to develop in the presence of excess epinephrine. The development of paroxysmal ventricular tachycardia was well demonstrated in case 2 and is undoubtedly a common cause of death at the time of operation. Because there is often a rise in blood pressure when the tumor is being manipulated, it should be handled gently. Several drugs are available for use in combating this marked elevation of blood pressure, including the benzodioxane drugs, phentolamine, di

benamine and others. The results obtained from the use of these drugs have been variable. There may be a dramatic fall in the blood pressure at the time of ligating the pedicle of the tumor. For this reason 1 norepinephrine whole blood and other indicated measures should be available for immediate use. In the two patients presented 1 norepinephrine was started before the tumor pedicle was clamped. In case 1 the blood pressure was well controlled during surgical intervention and for the ensuing 24 hours by using 4 cc of 1 norepinephrine in a 1 000 cc of normal saline administered at a slow rate. In case 2 it was necessary to use 16 cc of 1 norepinephrine in 500 cc of whole blood or in 1 000 cc of fluids and the rate of flow had to be increased to prevent hypotensive levels. An advantage of 1 norepinephrine over epinephrine for maintaining the blood pressure levels in patients with pheochromocytomas is that 1 norepinephrine increases the peripheral resistance and does not increase the cardiac output or produce cardiac arrhythmias. Cortisone was administered preoperatively as well as postoperatively to the two patients reported. There was no evidence of adrenal cortical insufficiency in either patient.

The surgical technic used in the two patients reported was the thoracoabdominal approach as described by Hood and Dickinson. This method proved most satisfactory and the tumors were readily accessible through this incision.

Close teamwork by the surgeon, the anesthetist, and the cardiologist is necessary in the management of a patient with pheochromocytoma. Adequate preoperative planning by all concerned is extremely desirable in this type of case so that the appropriate anesthetic agents will be employed, the desired preoperative medication administered, and an ample supply of all necessary drugs will be available in the operating room and the postoperative therapy outlined.

SUMMARY

Following surgical removal of the tumors in two patients with pheochromocytoma with paroxysmal hypertension the blood pressure remained completely normal and they both have remained asymptomatic. Postoperative histamine tests were negative in both of these patients. Postoperative electrocardiograms were normal whereas prior to surgical intervention tracings in both patients were grossly abnormal. In the immediate postoperative period 1 norepinephrine for maintaining stable blood pressure levels was used with good results in both patients. Retroperitoneal oxygen insufflation studies accurately localized the tumor masses in both patients and was a painless and completely safe procedure.

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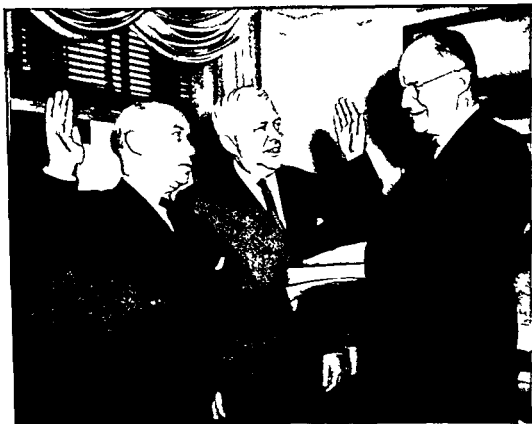
Postoperative Small Bowel Obstruction

The distinction between organic obstruct on and paralytic ileus in the distended vomiting postoperative patient is of the greatest importance. The added insult of reopening the abdomen of a patient who is suffering only from adynamic ileus may so aggravate his condition as to make his intestinal atony irreversible and ultimately fatal. On the other hand failure to operate upon the patient with organic obstruction to relieve that obstruction may be equally fatal. The roentgenographic examination is not an infallible guide. With the aid of the fluoroscope if need be it is almost always possible even in the most severely distended patient to get a long intestinal decompressing tube through the pylorus and into the upper small bowel within a few hours. If after 24 hours of continuous intestinal suction such a patient is still losing a great volume more fluid by his intestinal suction than he is able to take in by mouth it must be assumed that his obstruction is organic and persistent and will only be relieved by operative interference. In contrast it will be found that 24 hours of effective intestinal suction in the patient with simple adynamic ileus will not only correct his distention but will so restore the peristaltic activity of the small bowel that on c n no longer recover from the tube a volume of fluid equal to that which the patient is drinking. The importance of the nursing care cannot be overestimated.

—JESSIE GRAY

S g ry Gy l gy d
Ob t t c p 119 J 1954

Dr Frank B Berry Sworn in as Assistant Secretary of Defense



Dr Frank B Berry right former professor of clinical surgery at Columbia University College of Physicians and Surgeons is shown taking the oath of office as Assistant Secretary of Defense for Health and Medicine on 28 January 1954 in a ceremony at the Pentagon office of Secretary of Defense Charles E Wilson center The oath was administered by Mr John E Moore Director of Personnel Division for the Assistant Secretary of Defense for Manpower and Personnel

Dr Berry was appointed to this high position following the resignation of Dr Melvin A Casberg who has returned to private practice He is the second physician to become the Assistant Secretary of Defense

DIETHYLSTILBESTROL IN MUMPS ORCHITIS

WILLIAM T. HALL, L. T. 1 MC USNR
RAYMOND N. F. KILLEEN, L. ut nt 1 g ad MC USNR

THE status of diethylstilbestrol in the prophylaxis and treatment of mumps orchitis is not clearly defined, and it is desirable to do so. Diethylstilbestrol is an inexpensive, relatively innocuous drug, readily available to practitioners. On the other hand, convalescent mumps serum gamma globulin is expensive, difficult to administer in the dosage of 20 cc intramuscularly, and the supply is limited. Possibly for these reasons there has been no recent confirmation of the original good report in the prophylaxis of mumps orchitis. Bed rest has long been known to be of no value in preventing this complication.¹ In the active treatment of orchitis, surgical decompression has been recommended. This requires certain surgical skill, equipment, postoperative care and hospitalization, and does not offer any more to the patient than diethylstilbestrol therapy.²

The rationale for the use of this synthetic estrogen seems well founded. Children are not subject to orchitis, but the incidence of this complication increases to about age 17 years and declines after 30 as does mumps itself. Estrogens produce atrophy of germinal epithelium and Leydig cells by inhibiting the gonadotrophin production of the pituitary. These changes have been followed experimentally in rats,³ and have been applied clinically in the suppression of testicular function in prostatic cancer. How rapidly a satisfactory degree of suppression can be obtained is the crux of the problem. A lag of from six to 24 hours is to be expected before therapy is started. If 48 hours' treatment depresses function sufficiently, then statistical studies should show a reduction in the incidence of orchitis in the prophylactically treated group because the greater number occur from the third to the fifth day. If it does not, the severity of the orchitis might still be less in the partially suppressed testicle.

During our duty on the contagion ward of this hospital, we were uncertain as to the advisability of using diethylstilbestrol. When several patients developed orchitis while receiving this drug, we

considered it worthless and discontinued it. The incidence of orchitis appeared to increase, and at one time three out of five patients on the ward had this complication. Diethylstilbestrol was reintroduced at a higher dose (5 mg b i d), and there was a sharp drop in the incidence of orchitis developing after admission.

PROPHYLAXIS

We have reviewed all available charts of patients with the unequivocal diagnosis of mumps, who were admitted from May 1950 to June 1953. Of 110 patients, 17 to 47 years of age, 13 were admitted with orchitis. Table 1 shows that this is the approximate incidence of early orchitis found by others. The 13 patients were not included in the further consideration of the value of prophylactic diethylstilbestrol. There remained 97 patients who were admitted with mumps, but without orchitis, of these, 63 were given prophylactic diethylstilbestrol in doses varying from 0.5 to 20 mg daily (average, 8.3 mg), for from two to 15 days (average, 7.1 days). Nine of these developed orchitis (table 2). Of the 34 patients on symptomatic treatment alone, 11 developed orchitis (table 3). Were there more cases, this would be a statistically significant percentage. Moreover, if the 12 per cent that developed orchitis prior to admission (table 1) were added to the 32 per cent in the control group it would give a total incidence of 44 per cent. From table 4 it can be seen that this is an unusually high incidence for a service hospital where mild, uncomplicated cases are admitted as well as severe ones. The same reasoning is applied in table 5 in comparing the incidence of previously reported orchitis while on diethylstilbestrol prophylaxis with the general incidence of 22.5 per cent.

TABLE 1 *Incidence of orchitis on admission of patients with mumps*

Author	Number of patients	Patients having orchitis on admission	
		Number	Percent
Savran	262	29	11
Gell s et al ²	502	35	7
Hall & Killee	110	13	12
Total	874	77	8.8

TABLE 2 Patient's progress while on thyltholol

Age (y)	22	34	32	30	25	29	21	37	23
Initial m m r	Bl l	U l l	Bl l l	Bl l	Bl l l	Right b- maxillary gl d	Bl l	Bl l l	Bl l l
Initial m m r	105	103	102	104	104.8	102.6	103	103	102
Dose dm	1 mg d	1 mg q i d	0.5 mg d ly	5 mg q d 4 d y	5 mg t d	5 mg b d	5 mg d ly	5 mg b d	2 mg b d
Initial d m p e r u	6	3	8	4	3	5	2	3	5
Initial f t l	6	5	10	5	4	1	B for dm	4	6
Initial w l l g d	7	5 (Bl l)	10	5	5	6	3	4	6

TABLE 2 Patients developing orchitis while on diethylstilbestrol—Continued

Age of patients (yrs)	22	34	32	30	25	29	21	37	23
Diethylstilbestrol dose after onset of orchitis	1 mg tid at night	non	0.5 mg daily	no	5 mg tid (incised)	5 mg bid	5 mg bid	5 mg bid	2 mg bid
Duration of fever or illness (day)	3	5	2	4	5	2	2	3	3
Duration of swelling after orchitis (dys)	?	8	?	14	8	7	8	8	7
Hospital stay for orchitis (dys)	33	22	7	39	36	46	14	20	10
Other complications	nn	none	nn	Pulmonary embolism	none	judicial	nn	non	none

TABLE 5. Effect of chloral hydrate on the incidence of drowsiness

Athlete	Dose (mg)	Number of patients	Incidence of drowsiness		Incidence of drowsiness with chloral hydrate (percent)
			Number	Percent	
Norton ¹	15	45	7	15.6	24.4
Hayes et al	1 to 2	44	4	9.1	17.9
Saunders	3 to 4	80	9	11.1	19.9
Beattie	2	7	0	0	8.8
Hill and Allison	0.5 to 2.0	63	9	14.3	23.1
Total		239	29	12.1	20.9

All patients with drowsiness after chloral hydrate administration

vomiting that developed may have been due to the orchitis alone, in fact, emesis is not infrequent when the patient attempts to eat during the febrile period of severe orchitis

TABLE 6 *Number of patients developing orchitis according to hospital day*

Hospital day	Prophylactic diethyl stilbestrol	Control
1	0	0
2	1	4
3	2	3
4	1	2
5	2	1
6	1	0
7	0	0
8	1	1
Total	9	11

Most of the severe reactions to diethylstilbestrol have suggested a sensitivity to the drug. Exfoliative dermatitis,¹⁵ angioneurotic edema,¹⁶ herpetic eruption,¹⁷ rashes,¹⁷ and hepatocellular jaundice¹⁸ have been reported. These reactions have been remarkably few considering the wide use of the drug. We encountered one case of what we believe to be hepatocellular jaundice due to diethylstilbestrol, which because of its rarity is briefly reported here.

CASE REPORT

A 29 year old man was admitted 30 April 1952 for a tender swelling of the right submaxillary gland of about 12 hours' duration. Generalized aching of the legs had developed two days prior to admission, and the following day there had been an aching in the right thigh and groin. The patient gave no history of previous mumps or recent exposure. In the past he had manifested allergy to penicillin. Since 1944, he had had abdominal cramps and belching after meals and following nervous tension. A cholecystectomy was done in 1948 without relief of symptoms. Three subsequent upper gastrointestinal roentgenograms were normal.

On admission the patient was afebrile and manifested only the tender swollen right submaxillary gland, but was beginning to notice slight pain in the right testicle. On 5 May he developed an acute right orchitis with tenderness, redness, swelling, and fever.

to 102.6 F which subsided by lysis in two days. Visible jaundice, dark urine and liver tenderness without enlargement were noted on 9 May. Liver biopsy was not done. The liver function studies are shown in table 7. Five milligrams of diethylstilbestrol twice a day had been started on his admission to this hospital. The testicle returned to normal by 12 May and the drug was discontinued.

A glucose tolerance curve on 22 May showed a fasting level of 131, a rise to 195 in 30 minutes and a slow fall to 150 in two hours. During his 13 days on diethylstilbestrol the patient was anorectic, nauseated and vomited intermittently. Several liters of dextrose were administered. Because of the orchitis and long gastrointestinal history these symptoms were difficult to evaluate. He vomited on the fifth and sixth day after diethylstilbestrol was stopped. Improvement in well being began a few days earlier.

The only other drugs given prior to the onset of jaundice were three 30-mg and three 60-mg doses of codeine and seven 0.6-gram doses of aspirin over the three day period of febrile orchitis.

Negative studies were as follows: three complete blood counts, two urinalyses, Kahn, Davidson, four serum amylase, serum lipase and an upper gastrointestinal roentgenographic series. In an attempted cholecystogram the dye was not visualized. Erythrocyte sedimentation rates were repeatedly elevated through 19 May. The urine was positive for bile on that date but became negative before discharge. The patient made an uneventful recovery and was returned to full duty on 20 June 1952.

REACTIONS FROM DRUG

A report of a similar case concerned a 44 year old woman who took 12 mg of diethylstilbestrol for 14 days. Her symptoms developed on the sixth day of therapy, and liver function studies confirmed the presence of hepatic damage. A skin test was positive to diethylstilbestrol. She made an uneventful recovery with clearing of the jaundice.

Interestingly, jaundice secondary to testosterone therapy has been reported but neither an allergic nor hepatotoxic action seemed evident. The rarity of its occurrence has been noted. Reports of carcinoma of the male breast following prolonged diethylstilbestrol therapy for prostatic cancer have appeared^{1,2} but no fear of such a complication should be entertained in the short courses recommended here. Edema was not noted in any of our patients. It is known however that estrogens (and androgens) decrease sodium excretion with resulting sodium and water retention and cardiac patients should be observed for this com-

TABLE 7 *Resume of liver function tests*

	Date				
	May 9	May 18	May 26	June 2	June 9
Ser m bilirubin (mg per 100 cc)					
Direct	2.8	1.2	0.72	0.44	0.36
Indirect	2.7	1.1	0.51	0.22	0.27
Thymol turbidity (MacLagan units)	0.1	0.1	0.21	0.22	0.09
Cephalin-cholesterol flocculation	4	4	5	9	7
(24 hour)	Neg		±	1+	Neg
(48 hour)	Neg		1+	2+	1+
Alkaline phosphatase (Bodansky units)		5.0			

plication One patient, who had received 20 mg of diethylstilbestrol daily complained of tenderness of the breasts, one week after his last dose This persisted three weeks Pigmentation of the nipple and areola has been reported in intensive therapy with estrogen in cancer of the breast in men None was noted in the short-term therapy in this series Temporary loss of libido occurs in a small percentage

COMPLICATIONS OF MUMPS

Orchitis is by far the most frequent complication of mumps It is usually preceded for 12 to 36 hours by fever (table 2) although infrequently it develops without fever This occurs when the onset of orchitis is late in the disease Pain in the testicles often precedes the swelling but may occur concomitantly It is not infrequently present in those who never develop orchitis

Sterility is difficult to evaluate Both testicles were involved in two of 34 patients who developed orchitis This approximates the incidence reported by others^{1 2} About 50 percent develop atrophy, but even the partially atrophic testicle may contain normal sperm Therefore, it is not primarily because of sterility that a preventive is desired, and the practitioner should reassure his uneasy patient that sterility due to mumps is infrequent³

Pancreatitis was not a significant entity in this series Back ache occurred frequently but was usually relieved by a bedboard and heat

Encephalitis following mumps was not observed in any patients during the three years covered by this survey in the age group studied Two cases however were noted in children ages 3½ and 7 years They recovered on symptomatic therapy alone

Several cases of *salivary gland involvement other than the parotid* were excluded because of question of diagnosis

The results of complement fixation tests and skin tests for mumps were not recorded

SUMMARY

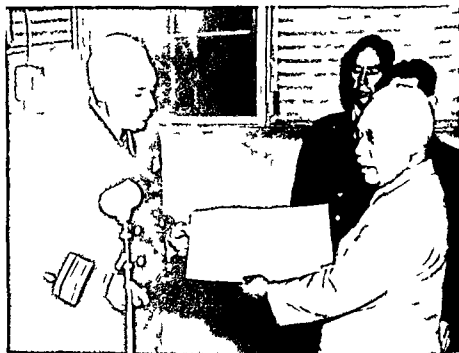
Nine of 63 patients with mumps given diethylstilbestrol prophylactically and 11 of 34 in the control group developed orchitis While these figures suggest that diethylstilbestrol is of value as a prophylaxis a more adequately controlled study is indicated Clinically the orchitis that developed during diethylstilbestrol prophylaxis appeared to be a milder form The value of diethylstilbestrol therapy in mumps orchitis already developed was not supported by this study The occurrence of serious reactions to diethylstilbestrol is rare but one patient developed hepatocellular jaundice due to this drug

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Admiral Pugh Honored by Japanese Medical Society



Re Admir l Lamont Pugh Surgeon General of the U S Navy is shown rece ng a certificate of honorary membership in the Yokosuka and Miura Medical Association from Dr S buro Harada president of the society on his recent visit to the U S Naval Hospital Yokosuka Japan dur g a 15-day inspection tour of naval medical facilities in the Far East

EPIDEMIC OF BACILLARY DYSENTERY ABOARD A NAVY VESSEL

WILLIAM H COPE *Lieutenant MC USN*

A RECENT outbreak of shigellosis aboard one of the vessels of the Atlantic Fleet re-emphasizes the great potential this disease possesses for quickly inactivating large segments of a military population.

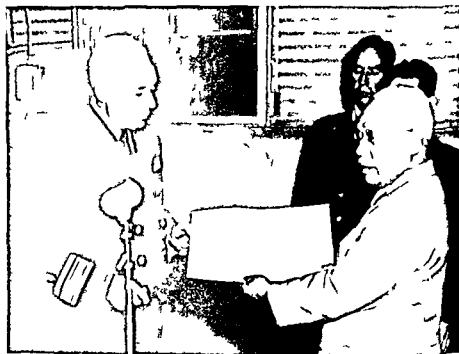
The annals of medical science contain many references to the Navy's costly and distressing experiences with shigellosis. In 1927¹ and again in 1930² there were extensive outbreaks among ships' crews in the Guantanamo Bay area. During World War II, when there was a major concentration of our ships in the Pacific, outbreaks of shigellosis became more frequent, finally assuming major importance by involving approximately 6,000 men on ships in San Pedro Bay at the head of Leyte Gulf, Philippine Islands.³ *Shigella* was for the moment a more sinister and effective foe than the Japanese Imperial Fleet. Thus introduced to the Pacific Fleet at San Pedro Bay, *shigella* probably was responsible for the outbreak among the personnel of ships anchored in Tokyo Bay during the latter part of 1945 and among ships en route to Bikini in May 1946.

REPORT OF AN EPIDEMIC

During the summer 1953, Ship "X" arrived in the harbor of a South American port (Port "A"), docked alongside the commercial piers, and immediately tapped into the local city water supply. Initial tests of the water showed that it contained no chlorine. It therefore was chlorinated in the ship's tanks to one part per million. The ship remained in this harbor for eight days. During this period all personnel of the ship were given liberty ashore, and a variety of fresh provisions were purchased for the ship in the local market. All fresh stores (such as lettuce and tomatoes) were soaked in solutions of sodium hypochlorite and potassium permanganate, then rinsed well before serving.

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On the sixth day in port a marine reported to sick bay with a temperature of 104 F slight nausea, bloody diarrhea and marked malaise. Although the causative organism was unknown at the time therapy was started with terramycin. During the next two days seven other patients were seen and treated symptomatically. Their diarrhea was much less severe clinically and was thought to have been caused by the internal trauma of excessive food and drink ashore.

After leaving port the ship was under way for 16 days to a second South American port (Port B). During this period the daily incidence of new cases of diarrhea reached a peak of 16 on the seventh day, with an average of eight new cases daily. All of the patients observed during this period who had high fever (over 102 F) and bloody diarrhea were admitted to sick bay and treated with 6 grams of terramycin given over a three day period.

Several days after leaving Port A it was observed that most of the ambulatory patients were not responding satisfactorily to symptomatic therapy (tincture of belladonna and bismuth and paregoric) and an effort was made in spite of the limited laboratory facilities aboard, to isolate and identify the agent or agents responsible. Rectal cultures from several of the ambulatory and admitted patients were carried from Endo's culture medium to lactose sucrose maltose, and dextrose sugars. Acid was produced only in the dextrose and a hanging drop of the cultures revealed no motility. In view of the symptomatology of the disease and the laboratory findings incomplete as they were, it was presumed that the causative organism was shigella, type unknown. From that point on because of the limited supply of aureomycin and terramycin on board, all ambulatory patients were treated with 3 grams of sulfaguanidine daily as long as the symptoms persisted the aforementioned antibiotics being reserved for more serious cases.

Before arriving at Port B the incidence of diarrhea was reduced to four or five new cases per day. The ship remained at this port for three days and liberty was granted ashore. No fresh food of any kind was brought on board and the water was chlorinated to one part per million.

After leaving South America, the ship was under way for about 46 hours to Guantanamo Bay, Cuba. During this period a sudden increase in the daily incidence of new cases of diarrhea to 25, was noted. Treatment was carried out as described previously and there was a sudden decrease in the number of new cases on the day of arrival in Guantanamo Bay. During the four days the ship was in port the majority of the crew were ashore at some time and consumed local products.

Almost immediately after leaving Guantanamo Bay, there was another severe increase in the incidence of new cases of diarrhea. During the three-day cruise to Norfolk, the daily incidence rose to a peak of about 70 new cases. The day after the ship arrived in Norfolk, the services of a preventive medicine unit were requested to evaluate and control the situation. As of that day, the incidence rates for the component parts of the personnel of the ship are shown in table 1.

TABLE 1 *Incidence of diarrhea*

	Total on board	Cases	Incidence (percent)
Crew	1 081	344	31
Officers	72	12	16
Midshipmen	332	139	41
Total	1 485	495	33

It was decided to obtain rectal cultures from 100 of the crew (including all food handlers). The ship was placed under limited quarantine for 48 hours, and every person aboard who had not been treated previously with terramycin was given 3 grams of this drug. At the end of the 48 hours, repeat rectal cultures were obtained from the same 100 crew members. Final rectal cultures were obtained from the same group 30 days later. The first series, run shortly after the arrival of the ship in Norfolk, revealed 11 positive cultures of *Shigella flexneri* 2a. None of the positive cultures were obtained from food handlers. All of the 48-hour cultures and the 30 day cultures were negative.

Even among the more severely ill patients, practically all symptoms ceased after treatment with terramycin for 24 hours. For four days following the prophylactic administration of this drug, no old or new cases of diarrhea were seen in sick bay, but on the fifth day five patients with very mild afebrile diarrhea were seen. These were cultured immediately and then were re-treated with 6 grams of terramycin over a three-day period. The cultures were negative for shigella and the patients became asymptomatic within 24 hours after the treatment was begun. Several members of the crew who were on leave at the time prophylactic treatment was given to all personnel on board developed severe febrile diarrhea, proved to be shigella by culture. They were treated with terramycin and remained asymptomatic. To our knowledge there have been no relapses or other occurrences of shigellosis on the ship.

to the date of writing. Cultures reported from random sample groups of this ship's crew are to be done in the near future.

ASSOCIATED CASES

The day following the arrival of the ship in Norfolk, a cook on another vessel which was docked on the port side of the same pier reported to sick bay with acute watery diarrhea. He was treated symptomatically, returned to duty and worked all day. That night the symptoms became more severe, he was admitted to sick bay and was treated with aureomycin.

Two new cases of febrile diarrhea developed on this ship two days later, three cases three days later, and finally four cases four days later. All of these patients were treated immediately with either aureomycin or terramycin and responded rapidly to either drug. Five days after the first case appeared, the preventive medicine unit was advised of the situation and rectal cultures were done on these 10 men. Two of the patients whose symptoms had first appeared the night before showed cultures positive for *Shigella flexneri* 2a. The other eight cultures were negative. Specimens from these 10 men were again cultured a week later and all were negative at that time.

COMMENT

It is fairly safe to assume that this organism, *Shigella flexneri* 2a, was introduced aboard Ship "X" from an infected local shore population via the feces-flies-food-fingers route, and that once installed among the closed population on board it was perpetuated by direct or indirect contact with those who were shedding shigella. The limitation of space on board most naval vessels results in very close contact among all personnel and facilitates the passage of shigella from person to person. In his report of the San Pedro Bay epidemic, Cheever² stresses personal contact and the contamination of sea water as the two most important factors in perpetuating and spreading the infection. Mount and Floyd pointed out the possibility that some defect in ship-board plumbing may result in pollution of fresh water lines with contaminated sea water.

A sanitary inspection made aboard Ship "X" shortly after arrival revealed the following major discrepancies:

- (1) Salt-water lines were in use in the scullery and vegetable-preparation room.

- (2) Rubber hoses were attached to numerous potable-water outlets, thereby making possible the return of used water into the potable-water system by back siphonage.

(3) Poor housekeeping practices were observed in the commissary spaces

(4) Food service personnel were not being trained and were not properly supervised in regard to sanitary practices

So far as can be determined there was no contact between personnel of Ship "X" and those of other vessels in port, previous to the time that every person on board was given terramycin. Flies or contaminated sea water, or both, probably played important roles in the transfer of the organism. Cultures of sea water from the area and from potable-water lines on Ship "X" and on other ships in the port were repeatedly negative for shigella, however, as were cultures from flies caught in this area.

SUMMARY AND CONCLUSIONS

In an epidemic of 495 cases of shigellosis which recently occurred aboard a naval vessel midshipmen and unrated men had, by far, the greatest attack rate. An attempt was made to eradicate a potentially large reservoir of shigella infection by treating all personnel aboard that vessel with or without symptoms, with terramycin.

Terramycin appears to be extremely effective in the treatment of patients with dysentery caused by *Shigella flexneri* 2a and apparently has reduced the carrier rate on board the ship to an extremely low figure.

In spite of greatly increased emphasis on sanitation and habitability aboard vessels of the United States Navy, shigella organisms are still capable of greatly decreasing the effectiveness of these ships as fighting units.

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It is a rule of thumb among educators that for every teaching hour two hours must be spent in preparation. It is an old rule and a good rule and it deserves the respectful consideration of any physician who calls himself a teacher.

—GEORGE E MILLER M D

in Diseases of the Chest p 453 Oct 1953

DIAGNOSTIC ERRORS IN SEVERE GASTROINTESTINAL HEMORRHAGE

EDDY D PALMER *Lt na i Col I MC USA*

IT was previously proposed that patients with massive upper gastrointestinal hemorrhage should ideally be examined esophagoscopically, gastroscopically, and roentgenologically immediately on hospitalization in order that the source might be identified with assurance as quickly as possible. The feasibility and safety of these procedures under conditions of massive hemorrhage and the assistance afforded both medical and surgical therapy have already been discussed¹ in connection with the presentation of 121 patients. It was pointed out that previous knowledge of the existence of a potential bleeding source may be most misleading when used to guide therapy for the current hemorrhage.

There remains to be determined whether the vigorous diagnostic approach permits significantly better therapeutic results than the delayed diagnostic approach. This article deals with experiences in emergency treatment based on the initial clinical working diagnosis and with the results of late diagnostic study among another group of patients with hematemesis from the same patient source and managed in the same surroundings. These patients, however, had not necessarily been free of gastrointestinal symptoms previously and were not investigated for the bleeding source until emergency therapy had been carried out and the acute clinical emergency had passed.

MATERIAL AND METHODS

Two hundred and twelve personally observed patients who had been hospitalized at this or another Army hospital because of hematemesis met the criteria for inclusion in this study: (1) the patient in each instance required transfusion of at least 1 000 cc of whole blood during the first six hours after admission and (2) no search had been made for the bleeding site until at least seven days had passed since cessation of the hemorrhage except that permitted by an emergency laparotomy in 25 patients. When diagnostic studies were not done a working diagnosis based on the initial history and physical examination with much

emphasis placed on a history of a previously diagnosed upper gastrointestinal disease and on statistical diagnostic expectancy, was decided on for each patient shortly after admission, and therapy was turned in a suitable direction. All patients who survived the hemorrhage were eventually submitted to a thorough diagnostic study, including roentgenologic examination in all gastroscopic examination in 164, gastric mucosal biopsy in 151, and esophagoscopy examination in 166. All of the patients who died were studied at autopsy.

TABLE 1 *Comparison of correct diagnosis with initial working diagnosis in 212 patients with severe upper gastrointestinal hemorrhage*

Cause of hemorrhage	Correct diagnosis (number of cases)	Working diagnosis (number of cases)
Duodenal ulcer	32	134
Esophageal varices	68	45
Erosive gastritis	22	6
Gastric ulcer	16	3
Hiatus hernia	13	3
Esophagitis	7	2
Mallory-Weiss syndrome	6	7
Stomal ulcer	3	7
Leukemia of stomach	2	1
Rendu-Osler-Weber's disease	2	1
Gastric polyps	2	0
Esophageal ulcer	1	0
Metastasis to stomach	1	0
Thrombocytopenia	0	1
Common bile duct lesion	1	0
Leiomyoma of stomach	1	0
Sarcoidosis of stomach	1	0
Carcinoma of stomach	1	0
Esophageal diverticulum	1	0
Aortic aneurysm	1	2
Undetermined	31	

There were 24 women among the 212 patients. The number of patients by age per decade from the second through the eighth decades was respectively, 9, 49, 51, 34, 39, 23, and 7.

TABLE 2 I f f e n c / k n o w l e d g e / t e n d e n c y / p o t e n t i a l b l e e d i n g s i t e / t h e d i a g n o s i s
68 p a t i e n t

Caus e h e m o h a g	N u m b e r			
	P r e s e n t l y d i a g n o s e d p o t e n t i a l h e m o h a g	C o n d i t i o n s w h e n p r e s e n t	C o r r e c t d i a g n o s i s	P r e s e n t l y k n o w n p o t e n t i a l h e m o h a g
D u o d e n a l	31	35	21	16
E s o p h a g i t i s	13	14	17	9
G a s t r i c	4	3	3	1
H i a t u s h e r n i a	3	3	5	1
S t o m a c h	9	7	3	3
E r o s i v e g a s t r i t i s	3	2	4	0
L u n g m e t a s t a s i s	1	1	2	1
E s o p h a g i t i s	2	2	1	1
R u d o l p h - V i r c h o w	1	1	2	1
G u n b o u n d f r a c t u r e	1	0	0	0
M a l l o r y - W e i s s s y n d r o m e	-	-	2	-
E s o p h a g i t i s	-	-	1	-
C r u r a l p o l y p	-	-	1	-
A n a s t r a c a	-	-	1	-
U n d e r m e a s u r e	-	-	5	-

The data presented are based on the diagnoses established after the bleeding had ceased and were determined by the demonstration of a lesion known to have bleeding potentialities. When more than one potential bleeding lesion was found in a patient—a common experience—the decision regarding the correct diagnosis was based on indirect evidence suggesting recent activity such as acute erosive esophagitis overlying esophageal varices, the usual roentgenographic signs of ulcer activity, erosive gastritis in the herniated portion of a hiatus hernia, or the typical history of the Mallory Weiss syndrome.

FINDINGS

Table 1 shows a comparison of the preliminary and final diagnoses in the 71 patients. Duodenal ulcer and stomal ulcer were often suspected but erosive gastritis, gastric ulcer, hiatus hernia, and esophagitis frequently were demonstrated as a final diagnosis. The source of hemorrhage was undetermined in 31

patients In the final analysis it was found that the working diagnosis had been correct in 75 patients (35 percent) and in correct in 109 It was not possible to decide the correctness of the diagnosis in 28 instances

The emergency treatment which had been instituted on the basis of the working diagnosis proved to have been the optimum in 116 instances Thus emergency treatment aimed at bleeding duodenal ulcer would in most cases be considered optimum if the correct diagnosis were found to be gastric ulcer Treatment was incorrect or inadequate in 68 patients The adequacy of therapy could not be judged in 28 instances

Diagnostic errors often were due to the assumption that the current hemorrhage originated from a lesion that had been recognized during a previous medical investigation The history of such a lesion was obtained at the time of admission in 68 patients (table 2) All but five of the 68 were given emergency treatment aimed at such a lesion but it was found that only 49 percent of these working diagnoses were correct

TABLE 3 Data on 18 d atbs as a result of gastro ntestinal hemorrhage

Cause of hemorrhage	Number of patients			
	Correct diagnosis	Condition for which patient was treated	Treatment for correct diagnosis	Emergency operation
Esophageal varices	9	12	9	0
Erosive gastritis	3	1	0	2
Gastric ulcer	1	0	0	1
Duodenal ulcer	2	4	0	1
Esophageal ulcer	1	0	0	1
Leukemia of stomach	2	1	1	0

Correct diagnosis actually determined by combined gastroscopic method

Eighteen patients died as a result of hemorrhage, five following an emergency operation (table 3) Hemorrhage from esophageal varices was the cause of death in 9 patients even though each had received optimum emergency therapy (tamponade) In only 10 of the 18 patients did the working diagnosis prove correct. Three of the five operations (subtotal gastrectomy) accomplished their purpose even though in two of these patients universal erosive gastritis was found Subtotal gastrectomy, however is not considered the optimum treatment for this condition Surgical intervention in the other two patients was ineffectual because the

TABLE 4 R I t / m g c y p t 25 p t t

C	th m rth g	Corr t d t g	t e p t e d t g	I e per u d g s e t	Op p p p r d u r	L p r t m y n l y
C t r l		6	2	1	6	
Duod l u l		4	17	3	3	1
F p h g l v a		4	2	2	3	
F r o t g t u		2	0	0	0	
f p h g e l l		1	0	0	0	1
H t r h		1	0	0	0	1
M t a t t o t m a c h		1	0	0	0	1
S r e o d f t m a h		1	0	0	1	
S t m l u l e r		1	1	1	1	
C o m m o l u l d u c t l s n		1	0	0	0	1
T h o m b o c y t p e a		0	1	0	0	
U d e t m d		3	2	0	-	2
Cor t d i a g w	u a l l y d m d b y m b d d g u c m h d					

bleeding site could not be found. Autopsy showed that the responsible lesion in one had been a duodenal ulcer and in the other, an esophageal ulcer.

TABLE 5 Comparison of present series with 121 patients in whom the vigorous diagnostic approach¹ was used.

Results	Delayed diagnostic approach in 212 cases (percent)	Vigorous diagnostic approach in 121 cases (percent)
Immediate diagnosis correct	35	78
Immediate therapy proved optimum	55	82
Source of hemorrhage undetermined	15	14
Deaths from hemorrhage	8	4
Emergency therapy directed at correct diagnosis	56	100
Emergency operation	12	16
Preoperative diagnosis correct	28	100
Operation proved to be the proper procedure	56	100

I h g d g ppr ch t ma t pp ga t t st nal h m rrh ge
 d od l l wa di g d wh r b ght blo d w s b ed th gh th ga
 t o p b flow g ba k t th st ma h thr gh th pylor th gh th
 l s o t lf w t I th s gr ps th d g sis ba ed o th obs vat
 pro d t be ct ch ca

Twenty five patients were operated on in an effort to stop the hemorrhage (table 4). Subtotal gastrectomy was done in 13 instances, vagotomy and gastroenterostomy in two, subtotal esophagogastric resection in one, and splenectomy in two. In seven instances conditions discovered at laparotomy did not suggest or permit a definitive operation. The diagnoses in these seven patients were esophageal ulcer, hemorrhage from common bile duct, duodenal ulcer, metastasis to stomach, and hiatus hernia each in one patient and undetermined diagnosis in 2 patients. In only 7 of these 25 patients did the preoperative diagnosis prove to be correct. In 14 patients, however, the surgical operation performed was compatible with the final diagnosis. Twenty of the patients operated on survived.

COMMENT

Certain aspects in the management of severe hemorrhage were notably poorer in this series than in the group approached by the vigorous diagnostic technique. A comparison is outlined in table 5.

The most important differences were in the proportion of cases which terminated fatally and the proportion in which emergency laparotomy permitted a proper and definitive surgical procedure

The list of final diagnoses among the two series is of special interest because it contains several diseases which are not often found in such listings and because some diseases which are supposed to be responsible for a large proportion of upper gastrointestinal hemorrhages were not impressive by their frequency. The supposed probability of duodenal ulcer in patients whose history and physical examination do not suggest another diagnosis proved to be the most misleading consideration in selection of the working diagnoses. Thus 63 percent of the present series were given emergency therapy for duodenal ulcer but in the final judgment it was found that only 15 percent had been bleeding from duodenal ulcer. Similar disillusionment was experienced with patients whose physical examination demonstrated the picture of classical Laennec's cirrhosis²—in a large portion the bleeding was found to be coming from sources other than esophageal varices.

The technic of complementing clinical judgment and roentgenologic examination with esophagoscopic and gastroscopic study during the period of active bleeding will alter considerably one's thinking regarding the usual causes of hemorrhage. In particular it will be found that misguidance more often than help is to be acquired from knowledge of an already demonstrated gastrointestinal disease and from the findings on physical examination.

SUMMARY

Because every instance of hematemesis must be considered of urgent importance and because medical or surgical techniques are available for direct attack on many of the lesions which may be responsible for massive upper gastrointestinal hemorrhage it is particularly important that a precise diagnosis be made without delay. A vigorous diagnostic approach consisting of esophagoscopic, gastroscopic and roentgenographic studies during the first few hours of hospitalization has proved both safe and feasible. The present review of 212 patients with hematemesis who were treated on the basis of the history and physical findings alone revealed an important amount of diagnostic error with inadequate or suboptimal therapy as a consequence.

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LOCALIZED FIBROUS LESIONS IN THE METAPHYSES OF LONG BONES

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LOCALIZED fibrous lesions appearing in the metaphyses of long bones have been described in diagnoses as monostotic fibrous dysplasia, nonosteogenic fibroma, cystlike area, metaphyseal fibrous defect,¹ or periosteal fibroma. Hatcher² reviewed the origin of these different descriptive terms and attributed their diverse interpretations to various students of this lesion who have overemphasized certain secondary characteristics. Jaffe and Lichtenstein³ consider them benign tumors formed from mature marrow connective tissue, Geschickter and Copeland⁴ as variants of solitary bone cysts and benign giant cell tumors.

All of the lesions described, however, have certain similarities. They appear either in, or immediately adjacent to, the metaphysis of a long bone. The great majority are in the distal end of the femur or the proximal end of the tibia. The symptoms, if any are produced, are very mild. The lesions are usually discovered on routine roentgenographic examination. Roentgenographically, they have a loculated appearance. They originate at the metaphysis and become elongated in the axis of the bone. They are well circumscribed with scalloped edges, and later appear to migrate from the epiphyseal line. The roentgenographic and the pathologic pictures vary according to the age and activity of the lesion.² The pathologic appearance is that of fibrous connective tissue with multiple but contiguous foci, gray yellow to yellow brown in color. Microscopic examination reveals whorled bundles of connective tissue cells. Foam cells and giant cells are frequently present, depending on the stage of development and the lipid content. A consistent and striking finding is the lack of osteogenesis.⁵

Epiphyseal defects are frequently found, in conjunction with metaphyseal lesions, on roentgenographic examination. Hatcher reported a series of 14 such cases, where osteochondritis of

the tibial tubercle or of the patella led to the discovery of a metaphyseal fibrous defect. These constituted one third of his reported cases

The cause of this condition is unknown. It is found commonly in children but rarely in adults. Although it is benign and self limiting and no treatment is necessary biopsy is advised to



Fig 1 Arrow indicates typical lesion of femoral metaphysis for identification of cortical defect

confirm the diagnosis. Ponseti and Friedman reported one case where three separate and distinct fibrous metaphyseal defects in the same area of the upper humeral metaphysis appeared developed and regressed over a period of 13 years.



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Fig. 2 (A) Low ($\times 35$) and (B) high power
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Figure 3 Postoperative roentgenograms of the knee joint showing the progression of healing one month after surgery

CASE REPORT

This 13 year old boy was first observed at another large military hospital because of pain in his right knee. Roentgenograms were taken at that time and a diagnosis of Osgood-Schlatter's disease was made. His leg was placed in a cylinder cast for six weeks. He was then brought to this hospital for removal of the cast and evaluation of the condition. Roentgenograms revealed an abnormal persistence of the epiphysis of the proximal end of the tibia and of the tibial tubercle and a radiolucent defect in the metaphysis of the distal end of the femur measuring about 2 by 1 centimeters. This defect was on the medial border and apparently extended through the cortex into the soft tissue (fig 1).

The patient was admitted to the hospital on 4 February 1953. Physical examination was within normal limits except for the right knee which was moderately swollen. There was moderate tenderness over the tibial tubercle but no other significant findings. Complete blood count and urinalysis were normal. The

sedimentation rate was 8 mm at the end of the first hour, blood calcium, 10.69 mg per 100 cc, inorganic phosphorus, 4.9 mg per 100 cc, and alkaline phosphatase, 11.1 Bodansky units per 100 cc. On 6 February 1953, a block resection was performed, at which time it was noted that the overlying cortex appeared normal and was not broken. A small amount of red yellow fluid extruded from the area upon removing the block of bone. Microscopic examination revealed a disruption of the cortex by a defect which extended into the medullary cavity. This defect was made up of whorls of collagenous tissue composed of fibroblastic cells. Rare giant cells were seen. There was a small area of osteogenesis at the center of this fibrous mass. The pathologic diagnosis was periosteal fibroma (fig. 2).

Postoperatively the patient did well, and roentgenograms taken on 5 May 1953 revealed beginning obliteration of the bony defect. By 23 July 1953 he was freely ambulatory with no functional defect, and roentgenograms showed obliteration of the defect (fig. 3).

COMMENT

This case fulfills all the requisites of a metaphyseal fibrous defect except for two variances. First, surgical intervention was necessary because of the extension through the cortex even though such lesions are known to be benign. Secondly, the microscopic slides revealed a definite area of osteogenesis, which we considered to be the result of the cortical involvement. It is suggested that "metaphyseal fibrous defect" is a more accurate term for these lesions than "nonosteogenic fibroma."

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It is of unique interest that the first appendectomy performed in the United States by Hall at the Roosevelt Hospital, New York, in 1886 was done after a hernial sac was entered for what was apparently a strangulated hernia.

—PHILIP G. CREESE, M.D.
in *Surgery, Gynecology and
Obstetrics*, p. 645, Nov. 1953.

SURGICAL CORRECTION OF DEVELOPMENTAL DEFORMITIES OF THE MANDIBLE

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SEVERE malocclusion was at one time disqualifying for military service but is not at present. Because of revised physical standards the surgical correction of developmental and other deformities of the jaws which existed prior to military services presents a new problem to Dental Corps officers.

A fair and equitable approach to this new problem was established. It is not practical to do a corrective operation on a person who is inducted for two years or less because he would be absent from duty for a minimum of five weeks while he recovered from the operation and would be required to be available for outpatient treatment for some time after that. Also the majority of the two year inductees are too young to be considered for this corrective operation which is contraindicated until full jaw development has been reached at the age of 21 or 22 years. Most persons with deformity of the mandible despite the associated malocclusion appear well nourished and give no history of weight loss following entry into the service. Many are not especially conscious of their deformity and it should not be called to their attention unless there is good reason to do so. Career soldiers on the other hand deserve and need a corrective operation. Acceptance of patients for treatment is therefore based on the following arbitrary criteria: (1) The career man must desire and request the treatment. (2) jaw development must be complete, and (3) correction of the deformity will result in improved function of the mandible with accompanying cosmetic benefits.

The three principal deformities of the mandible are prognathism (protrusion), micrognathia (retrusion), and apertognathia (open bite malocclusion). Causative factors are trauma, disease or infection or many times growth disturbances or atavism. Pro-

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trusions and retrusions, as a result of developmental deformity, are encountered most frequently and are the subject of this paper. Prognathism is seen more frequently, but is less difficult to correct than is micrognathia.

PROGNATHISM

The mandibular deformity of prognathism can be corrected by a variety of operative methods. However, most of the methods commonly applied have numerous disadvantages and the final results are frequently of doubtful benefit. Recently I advocated



Figure 1 (case 1) Extreme mandibular prognathism. Figure 2 (case 1) Facial contour after surgical intervention.

a new approach to surgical correction of this deformity.¹ This procedure is one in which the correction is obtained by vertical osteotomy in the ramus of the mandible, the section being made from the sigmoid notch downward over the mandibular foramen and through the lower border of the mandible at the angle. The anterior portion of the ramus is decorticated on its lateral aspect prior to its repositioning posteriorly. This operation is most suitable in cases of extreme deformity and is ideal for any patient requiring more than 10 mm. of correction. It is not recommended for deformities of lesser degree where osteotomy in the body of the mandible gives a good result. Surgical correction of prognathic deformities of less than 10 mm. in men is discouraged. Slight prognathism is not objectionable, and moderately severe Class III malocclusion does not ordinarily interfere with function. The following case history illustrates vertical osteotomy in the mandibular ramus.



Fig 3 (l) A lat l c ph l g am how g a 18-mm pr t us / th mand bl Fig 4 (s l) Surgical c r r t of p gnath m by crical o t t my th am of the mand bl produc d no mal k l l cont w

Case 1 A 30 year old man was admitted to this hospital on 13 April 1953 with a prognathic deformity requiring an 18-mm correction (fig 1) Routine preoperative examinations included posteroanterior and lateral cephalograms (fig 3) of the skull and study models (fig 5) On 15 April intramaxillary multiple loop wiring was placed on the teeth and the next day under general anesthesia bilateral vertical osteotomies were done Thirteen days after the operation the patient went home on convalescent leave Four weeks postoperatively the intermaxillary fixation was removed and he was permitted complete function He returned to duty in a little more than one month with functional



Fig 5 (l) A mod l f the t th how ng the Cla III m l cl ion Ma t t y functio wa m mal Fig 6 (a l) Th m l o clus n bou fig 5 ba be n corr t d to ormal thro gh gic l m t b o d s

occlusion (fig 6), improved appearance (fig 2), and an entirely new psychologic outlook. When seen five months later, scarring was negligible, no motor or sensory nerve damage was present, and his temporomandibular joints functioned normally. Final cephalograms disclosed normal skeletal contours (fig 4).

MICROGNATHIA

Mandibular retrusion is seen less frequently than prognathism. In the military service surgical correction of moderate deformities of this type is not justified but extreme retrusion of the lower jaw should be corrected because it is objectionable both from a functional and a cosmetic viewpoint.

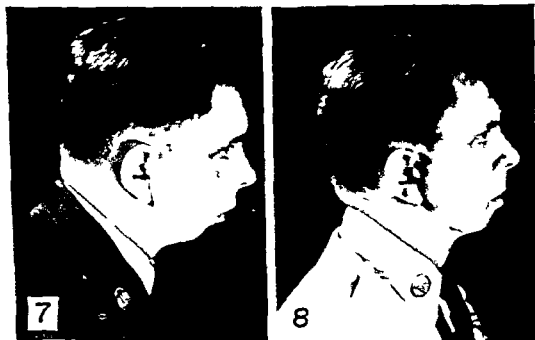


Figure 7 (case 2) Extreme retrusion (micrognathia) of the mandible. Figure 8 (case 2) The patient's appearance was improved by the sliding osteotomy.

Correction of this deformity can be accomplished by a sliding osteotomy as suggested by Hazanjan and Converse² and is performed in two stages. Theoretically the sectioning of the body of the mandible should be accomplished so that when the mandible is advanced anteriorly the cut surfaces will remain in contact. If first consideration is given to proper occlusal relation and masticatory function a space may result. Therefore, the placement of fresh medullary bone chips from the ilium is included in the procedure of this operation. The following case is illustrative.

Case 2 A 34-year-old man with marked retrusion of the mandible (fig 7) was admitted to this hospital on 23 April 1951.

fibrinogen found in these two fractions was clottable with thrombin indicating that the protein was not denatured when the pH was lowered. The fraction that precipitated when the pH of the filtrate was further lowered to 4.2 consisted for the most part of albumin plus some alpha globulin, beta globulin, and a very small amount of fibrinogen. The fraction precipitated at a pH of 4.0 was largely albumin with a small amount of alpha globulin and beta globulin. The remaining effluent was practically pure gamma globulin. This could be precipitated by an organic solvent preferably at a reduced temperature to avoid denaturation. Each fraction could be further subfractionated by closer adjustment of the hydrogen ion concentration.

SUMMARY

The protein components of biologic systems can be separated by an improved method using sodium tetrametaphosphate and acid or acid salts, the latter added in successive steps. The new process has been found useful when applied to human blood plasma. It can be performed with equal success on small amounts of material or in large scale operations.

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ACUTE MASTITIS OF THE NEWBORN DUE TO MICROCOCCUS PYOGENES VAR AUREUS

ROBERT W MOSELEY *Captain MC USA*

IN recent years various workers have reported as high as 75 percent of the strains of *Micrococcus pyogenes* var *aureus* cultured from various sources to be penicillin resistant.¹⁻⁴ With few exceptions these have been sensitive to aureomycin and, in a slightly smaller percent to terramycin as well. Accordingly, a broad spectrum antibiotic such as aureomycin has been advocated as the treatment of choice in infections due to these organisms.⁵ It was my experience, however, that antibiotic therapy usually was not sufficient to cure infants with a breast abscess due to *M. pyogenes* var *aureus* and, in the majority, an operation was required.

Fourteen (two percent) of 665 infants delivered in this hospital during a seven month period developed acute mastitis (table 1) two of them less than five days after discharge from the hospital.

No cause could be established but the possibility of a hematogenous spread with localization in an engorged area was postulated. Most of the infections were found to be in the area under the breast tissue and to have had no apparent connection with the ducts (fig 1). In no case was there any skin infection in other members of the family. In one instance the mother had attempted to express secretion from the infant's breast (fig 2). *M. pyogenes* var *aureus* was found on throat culture in four infants. Positive throat cultures in as high as 62 percent in healthy newborn infants have been reported.

All patients were treated with warm moist compresses and some antibiotic both prior to and following surgical drainage. This was found to be the most effective treatment. Proper care at home is important.

SUMMARY

The over all incidence of acute mastitis due to *M. pyogenes* var *aureus* in newborn infants at an Army hospital during a

TABLE I Patient with acute mastitis

P	Age	Cul		T	tm t	M ill
		Th	Ab			
1	15 d y	M py s n ur	M py s ur	P ill		T um t m s r h m Cl r d 5 d y
2	28 d y	D pl p um	M py s ur +	P cell d s	d urg l	
3	24 d y	N s r	M py s ur +	P ill d s	d urg l	
4	9 d f			P cell		Cl d 4 d y
5	21 d y	N s	M py s ur +	Aur my d s	d urg l	
5	28 d y	D pl M py s p m ur		P ill d s	d urg l d n s g	R ur h und p l m l
6	18 d y	E h h l	M py s ur	Aur my d s	d urg l	
7	9 d y	M py s ur		Aur my d s	d urg l	P ill p dm

TABLE 1. *Pathogenesis of acute mastitis—Continued*

Patient	Age	Culture		Treatment	Miscellaneous
		Throat	Abscess		
8	10 day	Micrococci		Penicillin streptomycin and surgical drainage	
9	12 d y	Negative	Micrococci +	Penicillin streptomycin and surgical drainage	
10	28 d ys	Bacterial hemolytic streptococcus		Penicillin and streptomycin	Vomited aureomycin Cleared in 3 days
11	10 day	Bacterial hemolytic streptococcus	Micrococci + bacterial hemolytic +	Penicillin streptomycin and surgical drainage	Vomited aureomycin
12	6 day			Aureomycin	Cleared in 4 d ys
12	19 day	Negative	Micrococci +	Aureomycin and surgical drainage	Sudden recurrence with fluctuation in 24 hours
13	15 d ys	Negative	Micrococci +	Aureomycin and surgical drainage	
14	14 days	Negative	Micrococci +	Aureomycin and surgical drainage	One of twin girl affected

Sensitive to penicillin + Sensitive to aureomycin Not sensitive to penicillin Not sensitive to aureomycin

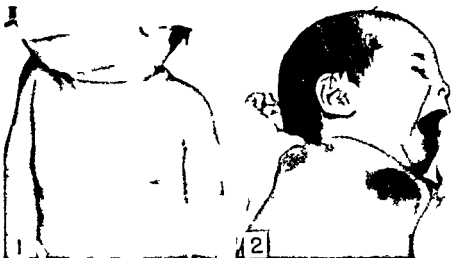


Figure 1 Appearance of partially developed unilateral abscess. Figure 2 Appearance of bilateral abscesses.

seven-month period was two percent. Treatment of the 14 patients with antibiotics indicate that surgical intervention at the proper time is essential for complete recovery of the patient.

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First Injection of Morphine

On November 28, 1853, the first hypodermic injection of morphine for the relief of pain was given by Dr. Alexander Wood, lecturer on preventive medicine. This fact is recorded in the *Edinburgh Medical and Surgical Journal* of April 11, 1855.

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SPONTANEOUS PNEUMOPERITONEUM

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ROBERT I. GARRETT *Lieutenant MC USA*

SPORADIC reports of cases of "spontaneous" pneumoperitoneum¹⁻³ have appeared in the literature, and different causative factors have been advanced to explain the condition, but true spontaneous pneumoperitoneum in the absence of any primary pathology is extremely rare. We desire to report such a case and to discuss the cause and prevention of this condition.

CASE REPORT

The 23 year old wife of a naval officer had been treated in the prenatal clinic through her first and second pregnancies. On 30 June 1952 and on 16 June 1953 she delivered spontaneously a normal infant at term. Both prenatal periods were uncomplicated, as was the first postpartum recovery. Following delivery of the patient's second child, her immediate course was uneventful and she was released from the hospital on 18 June 1953.

On the morning of 29 June 1953, the patient began postpartum exercises consisting of three sit-ups and assuming the knee chest position for five minutes. These were repeated just prior to taking an afternoon nap. She was awakened about three hours later by sharp pain in the right lower part of her chest, at the approximate level of the diaphragm. This was aggravated by deep inspiration. When in a supine position, she was markedly dyspneic and the pain became unbearable. These symptoms were partially relieved by sitting. Shortly after the onset of symptoms, she was seized with a severe shaking chill and continued to have chills and fever until admitted to the hospital about four hours after the onset of pain. The patient gave no history of cough or recent upper respiratory infection, but there had been an aching pain in her right lower leg, three days prior to admission, which gradually subsided. She also reported vague abdominal distress in 1949, which was controlled by a bland diet and alkalies.

Observation of the patient revealed marked dyspnea in the supine position with alleviation of symptoms after turning on her

right side When walking there was a slight limp favoring the right leg The temperature was 102.2 F pulse 94 respiration 24 and blood pressure 192/80 Physical and roentgenographic examinations showed the lung fields to be negative except for a Ghon tubercle, which had been noted in previous roentgenograms since March 1952 and air in moderate amount under both hemi diaphragms There was considerable tenderness in the epigastrium and in both lower abdominal quadrants and some tenderness in both breasts and in the right popliteal space

The laboratory findings were erythrocyte count 3,710,000 hemoglobin 8.5 grams hematocrit VPC 38 per 100 ml prothrombin time normal leukocyte count 10,500 with 78 percent neutrophils 16 percent lymphocytes 4 percent monocytes and 2 percent eosinophils urinalysis (catheterized specimen) negative

Following admission the patient developed severe pain in the left lower part of her chest The history of gastrointestinal distress which was relieved by bland diet and alkalis the tenderness now present in the upper part of the abdomen with free air under the diaphragm and the chest pain which radiated to the shoulder blade especially on lying down led us to believe that a ruptured duodenal ulcer was the most reasonable diagnosis Because the pain was increasing a laparotomy was deemed necessary

Approximately 16 hours following admission the abdomen was opened through an upper right pararectus incision Upon opening the peritoneum air pressure was released The stomach duodenum jejunum ileum and large bowel throughout their entire length were grossly normal The lesser peritoneal cavity was entered and investigated but no abnormalities were found The uterus was larger and softer than anticipated at 14 days post partum The fallopian tubes and ovaries were normal and the peritoneum presented a healthy appearance with no evidence of inflammation The abdomen was closed in layers

The patient's postoperative course was uncomplicated There was dramatic relief of her chest and abdominal pain On her first postoperative day a portable roentgenogram of her chest showed that the lungs were clear with no air present under the diaphragm She was discharged on the eleventh postoperative day

DISCUSSION

Of the previously reported cases one was an 81 year old woman in whom air was present in the peritoneal cavity following severe writhing in the knee chest position Another was a 25 year old woman who developed spontaneous pneumoperitoneum in her fourth postpartum week following bending over to move a small table In each of these cases it was assumed that the air

entered the peritoneal cavity through the genital tract Dodek and Friedman¹ pointed out that air usually enters the vagina during knee chest exercises, and frequently is the cause of fatal air emboli due to its entrance into the blood stream through an open vessel in a postpartum uterus

In the case presented, we believe that the air also entered the peritoneal cavity of the patient through the genital tract during knee chest exercises Although this condition is extremely rare, as noted by the paucity of these cases in the literature, it should be considered in the differential diagnosis of pneumoperitoneum in a postpartum patient whose uterus has not undergone complete involution

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Surgical Treatment of Aneurysms

Aneurysm of the thoracic or abdominal aorta is a fatal disease death usually results from rupture and hemorrhage within a few months after symptoms appear Likewise aneurysms involving the peripheral arteries may cause death from leaking or rupture but loss of a limb as the result of gangrene secondary to either thrombosis or embolism is the common complication Hence if the patient's general condition and life expectancy warrant it surgical treatment ought to be advised Those methods now available should be used in surgical treatment even though we are well aware of their shortcomings Furthermore we must search increasingly for better surgical methods against this condition

—JOHN C IVINS M D

in Proceedings of the Staff

Meetings of The Mayo Clinic

p 706 Dec 16 1953

TRAUMATIC DIPLOIC HEMATOMAS OF THE SKULL

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HAROLD W. LUFTERS *F t L t t MC USA*

JOHN L. MOYER *F t L e t t MC USA*

HEMORRHAGE into the superficial scalp and dissecting hematomas of the subperiosteal space frequently follow direct cranial trauma. Cephalhematoma is rare in newborn infants. An incidence of 0.6 percent was found in a representative series of 60,000 deliveries, but the incidence increases in protracted labor due to cephalopelvic disproportion. The extravasation of blood beneath the periosteum is usually absorbed in from three to six weeks. Occasionally the elevated periosteum deposits bone and a cyst is formed between the skull and ossified periosteum. This process rarely occurs in adults. No such cases were recognized at the Johns Hopkins Hospital during a 35 year period. In 1934 in a comprehensive review of cyst formations of the skull Chorobski and Davis reported three cases under the diagnosis of "encapsulated cephalhaematoma." These cystic hematomas were found between the periosteum and skull in two patients (as in infants) but in the other patient encapsulated hematomas occurred in the diploë of the cranial bones. Cyst production in these diploic hematomas results from hemorrhagic effusion into the spongiosa and marrow from a diploic vascular channel. A reactive proliferative process is stimulated if the extravasation organizes and remains unabsorbed. Granulation tissue containing giant cells is deposited and further serous effusion into the intramedullary space causes the formation of a cyst containing degenerated blood products. The diploic space filled with fibrous tissue, spongy bone, serum and patches of sclerotic bone expands and causes atrophy of the surrounding skull tables. These cysts differ from the recently described aneurysmal bone cysts of the skull in that they contain no cavernomatous blood filled spaces or bone septums.*

Usually the cystic subperiosteal and diploic hematomas cause no clinical symptoms other than soft bony swelling of the skull.

F m Valley Forge Army H p I Ph II P D Ros bl th ow th
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Severe pain was the presenting symptom in the case here reported

The roentgenographic appearance of the cyst is one of increased radiance with sharply defined sclerotic edges, frequently near a suture line. The skull tables are ballooned and thinned with the swelling toward the outer aspect of the skull.

Chorobski and Davis¹ and Geschlechter and Copeland² have treated these lesions by simple curettage with good results. It is believed, however, that complete excision of the cyst with a margin of normal bone is indicated because recurrence of the cyst has been observed after curettage. Block removal by craniectomy allows the surgeon to explore the subdural space at the time of operation and assures complete removal. In event the lesion, at operation or after pathologic examination, proves to be other than benign. Cranioplasty can be done at the time of removal of the involved bone and the continuity of the skull restored in one operative procedure.

CASE REPORT

A 30-year-old housewife was admitted to this hospital on 11 May 1953 with the referral diagnosis of left-sided intractable trigeminal neuralgia. Fifteen years prior to admission she had fallen from a moving truck and had been admitted unconscious to a hospital near her home. Roentgenograms of the skull at that time had revealed a linear fracture extending from the left occipital bone to the left parietal bone. After several days of lethargy and headache she recovered rapidly and, except for a nontender "lump" in the left parietal region, was asymptomatic.

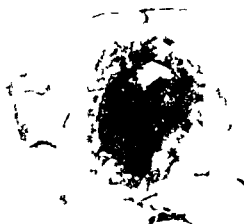


Figure 1 Cystic osteolytic lesion in the left parietal bone with irregular sclerotic edge



Fig 2 Roentgenogram taken 3 days after patient had the plaster for the dental implant covering the skull defect

Three months before this admission her scalp on the left side became exquisitely tender and a hemicranial headache radiating into the left maxilla and brow became so severe that she gained relief only by taking codeine every three hours. Several teeth in her left upper jaw were extracted without remission of the pain. Roentgenograms of the skull revealed an oval osteolytic lesion



1 2 3 4 5 6 7 8 9 10

1 3 4 5 6 7 8 9 10

Fig 3 Lateral view of the skull base showing the lesion in the middle of the skull base

in the left parietal bone measuring three centimeters in diameter (fig 1) Both tables of the skull were thinned and expanded at the site of the lesion. The margin of the cyst was outlined by sclerotic bone. A survey of the long bones, chest, and pelvis, and laboratory tests were normal.



Figure 4 Photomicrograph of cyst wall showing giant cells fibrous tissue and trabeculated bone (Hematoxylin-eosin stain $\times 40$)

The patient was apprehensive and guarded the left scalp by tilting her head to the left. The scalp mass was soft, cystic, about four centimeters in diameter, and nonpulsatile. There was no increase in vascularity of the left hemicranium or bruit over the mass. Visual acuity and visual fields were normal. On 19 May 1953 a left parietal craniectomy and tantalum cranioplasty were performed. There were perforations in both the inner and outer tables of the skull. The cyst was filled with clear, xanthochromic fluid and an adherent layer of granulation tissue.

covered the intact dura. Because of a recent report of chronic subdural hematoma causing skull erosion the dura was opened. The leptomeninges and brain appeared normal. Roentgenograms taken after the operation show the perforated tantalum plate covering the skull defect (fig 2). The patient was completely relieved of pain and was discharged 12 days after the operation.

PATHOLOGY REPORT

The tissue from both the dura and the bone cyst cavity contained partially degenerating bone and areas of hemorrhage and scattered throughout were fibroblasts and large prominent giant cells (fig 3). In most areas there was only a small amount of stroma supporting the cells. The sections from the periphery of the cavity contained areas of trabeculated bone covered by a thin layer of moderately dense fibrous tissue which contained a few scattered giant cells (fig 4). Overlying this fibrouslike tissue capsule was a blood clot.

A diagnosis of secondary bone destruction with osteoclastic activity or a primary giant cell tumor of bone with hemorrhage was considered. The paucity of the stromal elements and the fact that only a small amount of soft tissue was present ruled out a primary giant cell tumor. The lesion did not extend for any considerable distance into the soft parts covering the bone and microscopically there were no large blood lakes and definite large vessels as described in aneurysms of bone. Because of the gross appearance and the microscopic picture this lesion was considered an old diploic hematoma with bone erosion and giant cell reaction.

SUMMARY

Cysts of the skull may result from unabsorbed diploic hematomas following cranial trauma. An expansile osteolytic lesion is produced which has a characteristic roentgenographic appearance. The cyst may be painful but rarely produces neurologic symptoms. Because recurrence may follow simple curettage complete excision and cranioplasty is recommended in the treatment of these benign posttraumatic bone cysts.

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Certificate of Appreciation Given Dr Melvin A Casberg



Dr Melvin A Casberg right former Assistant Secretary of Defense for Health and Medicine is shown receiving a Defense Department Certificate of Appreciation recently from Secretary of Defense Charles E Wilson in which he was cited for distinguished public service . He is now in private practice in Solvang Calif

CONGENITAL MEGACOLON IN AN 18-YEAR OLD YOUTH

PHILIP A COX M J USAF (MC)
LEONARD D HEATON M J G at MC USA

THOUGH the literature contains many reports of patients with congenital megacolon observed earlier than the first publication by Hirschsprung in 1888 his name is firmly associated with this condition. Many causative theories for this condition have been advanced including pathologic changes in the dilated bowel, distal mechanical obstruction and sympathetic imbalance. There is now agreement among most authorities, however, that the primary cause of congenital megacolon is a neurologic defect of the rectum and the lower sigmoid colon. The defect is an absence of the myenteric plexus (of Auerbach) in the rectum and/or lower sigmoid colon. Due to this congenital absence peristalsis does not progress through the involved area and over many months the distal colon becomes greatly dilated. This theory, previously advanced by Tiffin and associates, Whitehouse and Fernohan, Dalla Valle, was confirmed by Swenson and his associates in 1949 who recommended that treatment consist of the excision of the neurologically deficient rectum and lower sigmoid. Swenson⁷ has since published his experiences and observations in which a "pull through" technique is described. Briefly, he recommends that the constricted portion of the rectum or rectosigmoid be resected, along with a portion of the dilated bowel by an abdominoperineal procedure in which the bowel to be removed is pulled through the distal segment and the anus. This procedure allows resection of the rectum down to the internal sphincter which Swenson believes to be necessary because often the ganglia are absent down to this point. The discrepancy in size of the proximal and distal segments is minimized by the pull through method.

Congenital megacolon should be suspected in a history of severe constipation dating from birth or immediately thereafter (in contrast to those cases of megacolon due to chronic constipation either functional or mechanical) and persistent enlargement of the abdomen. Barium enema studies done with

caution, usually show narrowing of the rectosigmoid in contrast to the dilated upper sigmoid and descending colon. Patients in whom dilatation down to the anus exists do not benefit from surgery.

Preparation of the patient for operation is of great importance and includes a low residue diet for several weeks, repeated enemas, and mineral oil daily. Preoperatively, an antibiotic bowel preparation is used. Because megalo-ureter is occasionally found associated with congenital megacolon, excretory urograms as well as other specialized genitourinary examinations should be made prior to surgery. The condition may exist in varying degrees of severity. Conservative treatment which includes diet, mineral oil, and enemas often suffices in mild cases. Drugs, such as methacholine chloride and other parasympathetic stimulants are of limited value. Sympathectomy is no longer used. Colostomy¹² may be necessary for severe, unrelieved constipation or for lavage when enemas have not been effective preoperatively.

CASE REPORT

The patient, an 18 year-old youth, complained of severe chronic constipation since birth. This patient had had no normal bowel movements since birth and for the first two years of life regular enemas and use of a long rectal tube were necessary. Up to six years of age, two to three high colonic irrigations were given him each week. At the age of six years he was operated on for acute intestinal obstruction due to volvulus of the dilated colon, at which time the volvulus was released. When he was 12 he had another episode of acute abdominal pain and distention which was relieved by conservative therapy. Following this it was necessary to give one high colonic irrigation daily. At 14 he found that 2 ounces of mineral oil daily along with daily irrigations resulted in adequate bowel movements. At this time he became aware of a gradual enlargement of his waistline, associated with severe shortness of breath on exertion, which prohibited his participation in school sports and proved a source of constant embarrassment. Considerable emotional upset was occasioned by his inability to dance and by a lack of normal association with girls.

The most significant factor in his past history was rheumatic fever at the age of 10, which kept him from school for a year. His weight on admission was 160 pounds which represented a loss of 25 pounds during the past year.

Physical findings on admission included blood pressure of 126/92, pulse, 84 and temperature, 99.8° F. He was well developed, well nourished, and in no acute distress. The most outstanding observations were the greatly distended abdomen and

wide flaring lower costal margin with a 180° angle at the midline. No abdominal masses were palpable. There was a well healed lower left rectus scar. A cautiously given barium enema roentgenogram revealed an extremely dilated sigmoid colon occupying the whole abdominal cavity, and a narrow constricted area in the rectosigmoid region.

Course in hospital Preoperative preparation of the patient's bowel was begun two weeks prior to admission to the hospital on 10 August 1953. Then more intensive bowel preparation was



Fig. 1 The greatly dilated sigmoid colon is grasped at the flexure. The narrowed colon at the right edge of the photograph.

begun including cathartics, mineral oil, multiple enemas, low residue diet, and the administration of neorycin phthalylsulfathiazole (sulfathalidine) for 48 hours (total dose of 6 grams of neorycin and 9 grams of phthalylsulfathiazole). On 14 August 1953, using gas oxygen ether endotracheal anesthesia, the abdomen was opened through a long left paramedian incision. The dilated sigmoid was 12 inches in diameter at its largest point and filled all of the abdominal cavity visible through the long incision. In spite of the long preoperative bowel preparation, the colon was still full of air and feces, and it was necessary to irrigate through the anus by means of a large rectal tube.

after which a solution of neomycin phthalylsulfathiazole was instilled through the tube. It was then possible to retract the specimen out of the wound. At the junction of the sigmoid with the rectum, near the peritoneal reflection, the bowel was definitely and suddenly narrowed (fig 1). The dilatation extended almost to the junction of the upper and middle thirds of the descending colon. The peritoneal reflection was incised and the entire left colon resected. A primary, two-layer, anastomosis was performed with no tension between the distal third of the transverse colon and the rectum. The dilated descending colon was not used for anastomosis because the bowel wall was greatly thickened and no peristalsis was present. (The pathologic report subsequently confirmed the presence of ganglia in the sites selected for anastomosis.) Postoperatively, Wangensteen gastric suction was continued for four days, and the fluid and electrolyte balance were maintained by the intravenous method. The patient had a bowel movement on the fifth postoperative day. He was kept on a soft diet until the tenth postoperative day, and on a low residue diet for the following two weeks. After the seventh day he had daily, or twice daily, bowel movements with no difficulty. The anterior abdominal wall was relaxed and thin, similar to that in the postpartum state. Physiotherapy and graded exercises were employed for several weeks to increase the strength and tone of the muscles.

Observed three months after the operation, the patient was having normal daily bowel movements without recourse to enemas, laxatives, or high colonic irrigations which had been used for 18 years. The previously straight costal angle had assumed its normal position. He returned to college and was able to participate in normal social functions for the first time.

COMMENT

A pull through operation was not done in this case because of the discrepancy in size between the dilated sigmoid and the narrowed rectum, and because of the marked thickening of the bowel wall. The anastomosis was performed low on the rectum where subsequent pathologic examination revealed the presence of normal ganglia. The entire left colon was resected and the distal third of the transverse colon used for the anastomosis. The postoperative course was uneventful.

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Medical Officers Elected to American College of Physicians

At a recent meeting of the Board of Regents of the American College of Physicians the following regular Medical Corps of ficers were elected to membership as fellows and associate fellows

Fellows

L C I F k L B USA	Lt C I J me A Orb on USA
Col Albe t A B d ma USA	C I B n j m n A Str kland Jr USAF
Col Edw d A Cl USA	Lt C I W l l a m M W bb USA

Associate Fellows

Comd J h W Albe t USN	L C I J m H H mm d USAF
Cap F k H A t USA	L C I R be t C H t J USA
L C I W l l m S B g all LSA	Lt C I R be t S J ord n J USA
Cap J m C B H LSA	C I Jo ph H M N h USA
Col W l b u r C B y USA	C I Cha l k Morr USAF
Comd R be O Ca d f USN	Lt C I W l l m N P pe f USA
L D d B C m h l J USN	Capt Gl H R hm d USA
L C I Cha l S Chr on USA	M j J h A Sh dy USA
Maj D d L D h USA	Maj W l l m H W tb ook USAF
L C I Ca l N Ekma USA	

PROCAINE HYDROCHLORIDE ALLERGY IN REGIONAL ANESTHESIA

JAMES E. CHIPPS *Lieutenant Colonel DC USA*
EDWARD ZUCKER *D D S M D*

PROCAINE hydrochloride has low toxicity as an anesthetic agent and few reports of undesirable reactions to it, such as idiosyncrasy, allergy, or toxic responses to an over dosage, can be found in the literature. In routine dental procedures, the toxic dose is not remotely approached even if the entire dose is inadvertently given intravenously and this reaction is of little practical import. Generalized reactions in persons sensitive to this drug have been described.¹ Fortunately, such a reaction is rare as it cannot be anticipated and little can be done to prevent it. All dentists are familiar with the hypersensitivity to procaine manifested by contact dermatitis of the hands. Little has been reported, however, of allergies to the drug when injected. Rickles² cited most of the reports and described a probable procaine allergy in 10 patients at about the time we were observing the following case.

CASE REPORT

A 23 year old man was referred to the dental clinic of this hospital with a diagnosis of "cellulitis of the face." The upper left third molar had been extracted five days previously under local procaine hydrochloride anesthesia. Swelling of the face began the same evening. On the following morning his face and palate were so enlarged that he returned to the dentist. He was given aureomycin for two days with only questionable improvement. Two days before admission he was given a total of 900,000 units of penicillin in three intramuscular doses. On the day before admission the edema of the face increased and he was then referred for hospitalization.

Past history disclosed an allergic reaction to sulfonamides, characterized by fine rash and itching. He had received several injections of penicillin previously without any reaction. There

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was no history of hay fever asthma or allergy to foods His sister had hives like reactions to tomatoes

On admission to this hospital, the patient had marked swelling, without redness or tenderness of the orbital and infraorbital areas of the left side of his face A fine macular rash was present over the chest and abdomen His temperature pulse and respirations were normal The site of the recent tooth extraction was healing satisfactorily but moderate edema of the palate and a carious pulp exposure of the upper right first molar were present He was given 100 mg of tripeleennamine hydrochloride (pyribenzamine) three times daily and during the next three days he improved considerably



Fig 1 Erythematous reaction from 1 percent procaine

Four days after admission the carious right molar was extracted under 2 percent procaine anesthesia The operation was uneventful but on the following day the right side of his face was markedly swollen and the palate was edematous The tooth socket contained a normal clot without evidence of infection and the patient had no pain A white blood cell count revealed 13 700 leukocytes with 54 percent neutrophils 36 percent lymphocytes 2 percent monocytes and 8 percent eosinophils Because an allergic reaction to procaine was suspected antihistamine therapy was again employed and the swelling subsided in a few days

After a period of 48 hours without medication a skin test for procaine hypersensitivity was made on the left forearm with 1 percent procaine Seven hours later the entire arm began to itch and the wheals exhibited a severe four plus reaction (fig 1) The patient again was given tripeleennamine hydrochloride therapy Regression of the local symptoms began but the following day he

neglected to take the drug and a severe systemic allergic reaction occurred. It was characterized by generalized urticaria with itching, marked circumorbital (fig. 2) and palatal angioneurotic edema, and a fever of 100.4° F. The leukocyte count at this time was 9,800 with 11 percent eosinophils.



Figure 2 Recurrence of edema of the circumorbital areas and the right cheek.

The patient was given 50 mg. of diphenhydramine hydrochloride (benadryl), 24 mg. of ephedrine and 16 mg. of phenobarbital every four hours. Calamine lotion was used locally over the areas of itching. The reaction gradually subsided and in three days he was well.

DISCUSSION

Local allergic reactions followed procaine injections on three occasions in this patient and in each instance he responded well to routine antiallergic management. One reaction was precipitated by an intracutaneous skin test confirming the diagnosis of procaine allergy. Certain features in this case, together with recent reports^{2,3} indicate that procaine allergy is not as rare as believed. Our patient was admitted because of local swelling, thought to be the result of cellulitis. Dentists are familiar with certain benign postoperative swellings which do not appear inflammatory or hemorrhagic. The term "traumatic edema" is usually employed for such a condition. In each of the three allergic episodes, local edema was prominent and on one occasion there

were no other manifestations at all. Apparently procaine allergy may occur as a local phenomenon and must be distinguished from a hematoma postextraction traumatic edema cellulitis or other common postoperative complications. Silverman³ in a preliminary report of an extensive project relative to the prophylactic use of antihistamine drugs in oral surgery found that there was a markedly diminished rate of postoperative swellings when they were used. He was not concerned with procaine injections in his series, but stated that the phenomenon of postoperative swelling may sometimes be on a localized hypersensitivity basis.

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Management of Anemias

The successful treatment of anemia depends on appreciation of the significance of anemia and the circumstance under which it may develop as well as on accurate differential diagnosis. In considering the claims for various proposed therapeutic agents the physician should note the differences as well as the relation of experimental studies and clinical practice. In the case of many essential substances whether vitamins or minerals human requirements are so low that deficiency is very unlikely or never occurs. In the case of other nutrients special conditions must exist before deficiency will develop. Storage of essential substances is an important safety factor while synthesis by bacteria growing in the bowel is an occult source of certain vitamins.

The shotgun type of hematinic is the modern counterpart of the patent medicine of yesterday. There is no short cut to the treatment of anemia. Nevertheless the application of the advances made in the last few decades is simple and depends on a ounce of knowledge and an equal amount of understanding and a pound of thoroughness.

—MAXWELL M. WINTROBE

B. I. I. of the N. W. Y. k.

Academy of Medicine

p. 25, June 1954

BILATERAL HYPERTROPHY OF THE MASSETER MUSCLES

BERNARD N SODERBERG *Colonel MC USA*

WALTER E SWITZER *Captain MC USA*

OF the few cases of masseter muscle hypertrophy in the literature, Legg (1880) appears to have recorded the first. His patient, age 10 years, demonstrated bilateral involvement and an associated hypertrophy of the temporal muscles. Hersh¹ reported observation of hypertrophy of the masseter during routine examinations of troops for communicable diseases. Maxwell and Waggoner² reported the condition as a clinical entity. Tempest³ reported unilateral hypertrophy and suggested surgical correction. Only two surgical methods of treatment have been reported. In 1947, Gurney altered the condition observed in a patient by excising muscle of the outer surface of the masseter. Cosmesis was his indication for operation. A comparative procedure was reported by Adams⁴ in 1949. His technic differed from the Gurney method by confining the muscle resection to the medial area. It is this latter procedure that has been used on the patient presented in this article.

CASE REPORT

A 20-year old soldier was referred to this hospital on 13 February 1953 for treatment of bilateral enlarged masses located in the region of the mandibular angles (figs 1A and 1B). The patient had observed a swelling in this location for eight months. In March 1952 he developed a small painful tumor mass behind the mandible and below the ear on both sides of his face. These enlarged gradually until it was thought that he might have mumps. The swelling gradually subsided only to recur again in June 1952. There was no contributory familial history.

The only positive findings were bilateral enlargement of what appeared to be soft tissue masses located at the angle of the mandible and rigidity in these areas when the patient clenched his teeth, chewed gum, or ate. There was no associated adenopathy. Laboratory study findings were normal. A diagnosis

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of bilateral hypertrophy of masseter muscles was confirmed by the oral surgical section of the dental service

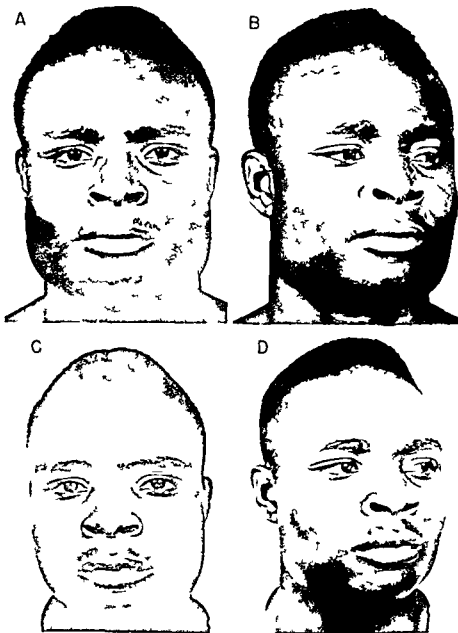


Fig 1 (A) and (B) Pre-operative facial appearance. (C) and (D) Post-operative facial appearance. Comparison of the facial width before and after surgery. The width of the face is one third of the face. Note the difference in the facial width.

The surgical technique used in this patient was as follows. Bilateral incisions were made in the shadow areas along the

lower border of the mandible in the angle position. These were carried down to the periosteum. The masseter was elevated by dissection. The incisions were continued upward involving about two thirds of the muscle attachment. The lower medial portion was then excised (fig. 2A). An incision was then made into the periosteum allowing it to be elevated from the bone over the splayed angle portions. The Luc saw was used to resect the

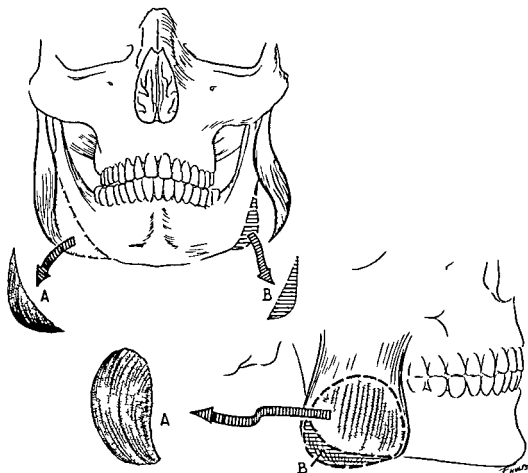


Figure 2 Diagrammatical representations of a masseter resected for narrowing the lower one third of the face (A) Portion of masseter excised (B) Portion of mandible excised

excess bone (fig. 2B). The remaining sharp edges of bone were rounded with a rasp. The periosteum was then sutured in place. The muscle was approximated and the subcutaneous tissues closed with fine catgut. Black silk was used for skin closure. A hard and chin type Barton bandage was fixed in place and left in position for four weeks. The patient achieved full range of jaw motion by the sixth postoperative week (figs. 1C and 1D). He had no complications. Microscopic studies of the resected material showed normal muscle and normal bone tissue.

DISCUSSION

It is suggested that the condition described in this article may be more common than the literature would indicate. The cosmetic indication for operation might seem of prime importance especially in female patients. In the case reported the patient had a complete personality change following his surgical reconstruction. His recalcitrant personality was replaced almost immediately by one of complete co-operation and appreciation. During his convalescence he served as an assistant corpsman on the plastic service. His work was carried out with efficiency and understanding. He returned to duty still continuing in this marked change. It is not our purpose to advocate facial alterations as a cure for maladjustments but in this one exceptional situation it appeared to be of benefit.

The cause of masseter muscle hypertrophy in the patients reported is unknown. It has been suggested that the nervous habit of grinding the teeth or the habitual clenching of the jaws might be a factor; however, easy fatigue of jaw muscles without an associated hypertrophy in other muscles of mastication has been observed in such patients. Masseter hypertrophy also may be present with or without an associated flaring of the mandibular angles. Specific reference is made to the absence of malocclusion, temporomandibular joint derangements, muscle hernia, and conclusive neurologic or electromyographic findings. Histologic examination of muscle sections from a few patients using special stains showed some of the muscle fibers to be larger than others and to have few, if any, striations.

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Partial gastrectomy is the operation of choice if at emergency laparotomy for hematemeisis or melena no causal lesion is found in a patient aged more than 50.

— GORDON FERGUSON, M.D.

Lancet p. 754 Oct. 10, 1953

THE ARMY SURGEON

SIR WILLIAM OSLER M D F R S

AT the outset I am sure you will permit me, on behalf of the profession, to offer to the Army Medical Department hearty congratulations on the completion of the arrangements which have made possible this gathering. With capacities strained to the utmost in furnishing to students an ordinary medical education the schools at large cannot be expected to equip army surgeons with the full details of special training. A glance at the curriculum just completed brings into sharp relief the disabilities under which previous classes must have proceeded to their labours, the members of which have had to pick up at random—in many cases have probably never acquired—the valuable knowledge traversed in the lectures and laboratory exercises of the session. But greatest of all the advantages of an army medical school must be counted the contact of the young officers with their seniors, with the men under whose directions they subsequently have to work. In comparison with their predecessors, with what different feelings and ideas will the men before us enter upon their duties in the various posts to which they have been assigned. Instead of hazy notions—perhaps to one fresh from the Examining Board not pleasant ones—of a central authority at Washington, of a Yama enthroned as Secretary of War, and of an exacting Surgeon General, the young officer who has enjoyed the delightful opportunities of four months' study amid these inspiring surroundings which teem with reminders of the glories of the corps and of the greatness of his profession, the young officer I say, must be indeed a muddy mettled fellow who does not carry away not alone rich stores of information, but most precious of all educational gifts, a true ideal of what his life work should be.

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each case tell on your education. The value of experience is not in seeing much but in seeing wisely. Experience in the true sense of the term does not come to all with years, or with increasing opportunities. Growth in the acquisition of facts is not necessarily associated with development. Many grow through life mentally as the crystal by simple accretion and at fifty possess to vary the figure the unicellular mental blastoderm with which they started. The growth which is organic and enduring is totally different, marked by changes of an unmistakable character. The observations are made with accuracy and care no pains are spared nothing is thought a trouble in the investigation of a problem. The facts are looked at in connexion with similar ones their relation to others is studied and the experience of the recorder is compared with that of others who have worked upon the question. Insensibly year by year a man finds that there has been in his mental protoplasm not only growth by assimilation but an actual development bringing fuller powers of observation additional capabilities of mental nutrition and that increased breadth of view which is of the very essence of wisdom.

As clinical observers we study the experiments which Nature makes upon our fellow creatures. These experiments however, in striking contrast to those of the laboratory lack exactness, possessing as they do a variability at once a despair and a delight—the despair of those who look for nothing but fixed laws in an art which is still deep in the sloughs of Empiricism the delight of those who find in it an expression of a universal law transcending even scorning the petty accuracy of test-tube and balance the law that in man the measure of all things mutability variability mobility are the very marrow of his being. The *clientèle* in which you work has however more stability a less extended range of variation than that with which we deal in civil life. In a body of carefully selected active young men you have a material for study in which the oscillations are less striking and in which the results of the experiments i. e. the diseases have a greater uniformity than in infancy and old age in the enfeebled and debauched. This adds a value to the studies of army medical officers who often have made investigations in hygiene dietetics and medicine so trustworthy and thorough that they serve us as a standard of comparison as a sort of *abscissa* or base-line. Thus you have demonstrated to us and to the community at large the possibilities of stamping out smallpox by systematic revaccination in civil practice we strive to reach the low rate of mortality of army hospitals in the treatment of typhoid fever and of pneumonia. Many of the most important facts relating to etiology and symptomatology have come from camp or barrack. I often think

that army surgeons scarcely appreciate that in their work they may follow the natural history of a disease under the most favourable circumstances the experiments are more ideal, the conditions less disturbing than those which prevail either in family practice or in the routine of the general hospital. Many of the common disorders can be tracked from inception to close, as can be done in no other line of medical work, and the facilities for the continuous study of certain affections are unequalled.



Osler in Baltimore about 1905 shortly after he had decided to leave Johns Hopkins University to become Regius Professor of Medicine at Oxford

Thus which is a point to be appreciated in the intrinsic education of which I spoke gives you a decided advantage over your less favoured brethren.

Your extraordinary range of observation, from the Florida keys to Montana from Maine to Southern California, affords unequalled facilities for the study of many of the vexed problems in medicine—facilities indeed, which in the diversity of morbid conditions to be studied are equalled in no position in civil life.

These are but a few of the questions suggesting themselves to my mind to which, as chance affords you could direct your attention. In a ten or fifteen years service travelling with seeing eyes and hearing ears and carefully kept note-books just think what a store-house of clinical material may be at the command of any one of you—material not only valuable in itself to the profession but of infinite value to you personally in its acquisition rendering you painstaking and accurate and giving you year by year an increasing experience of the sort to which I have already more than once referred.

In what I have said hitherto I have dwelt chiefly on your personal development and on the direction in which your activities might be engaged but while you are thus laying the foundation of an education in all that relates to the technical side of the profession there are other duties which call for a word or two. In the communities to which you may be sent do not forget that though army officers you owe allegiance to an honourable profession to the members of which you are linked by ties of a most binding character. In situations in which the advantages of a more critical training give you a measure of superiority over your *confreres* in civil life let it not be apparent in your demeanour but so order yourselves that in all things you may appear to receive not to grant favours. There are regions in *partibus infidelium* to which you will go as missionaries carrying the gospel of loyalty to truth in the science and in the art of medicine and your lives of devotion may prove to many a stimulating example. You cannot afford to stand aloof from your professional colleagues in any place. Join their associations mingle in their meetings giving of the best of your talents gathering here scattering there but everywhere showing that you are at all times faithful students as willing to teach as to be taught. Shun as most pernicious that frame of mind too often I fear seen in physicians which assumes an air of superiority and limits as worthy of your communion only those with satisfactory collegiate or sartorial credentials. The passports of your fellowship should be honesty of purpose and a devotion to the highest interests of our profession and these you will find widely diffused sometimes apparent only when you get beneath the crust of a rough exterior.

If I have laid stress upon the more strictly professional aspects of your career it has been with a purpose. I believe the arrangements in the department are such that with habits of ordinary diligence each one of you may attain not only a high grade of personal development but may become an important contributor in the advancement of our art. I have said nothing of the pursuit of the sciences cognate to medicine of botany zoology geology ethnology and archaeology. In every one of

these, so fascinating in themselves, it is true that army medical officers have risen to distinction, but I claim that your first duty is to medicine, which should have your best services and your loyal devotion. Not, too, in the perfunctory discharge of the daily routine, but in zealous endeavour to keep pace with, and to aid in, the progress of knowledge. In this way you will best serve the department, the profession, and the public.

Generalities, of the kind in which I have been indulging, though appropriate to the occasion, are close kin, I fear to the fancies fond, that vanish like the gay motes which float for a moment in the sunbeams of our mind. But I would fain leave with you, in closing, something of a more enduring kind—a picture that for me has always had a singular attraction, the picture of a man who, amid circumstances the most unfavourable, saw his opportunity and was quick to “grasp the skirts of happy chance.” Far away in the northern wilds, where the waters of Lake Michigan and Lake Huron unite, stands the fort of Michilimackinac, rich in memories of Indian and *voyageur*—one of the four important posts on the upper lakes in the days when the Rose and the Fleur-de-lis strove for the mastery of the Western world. Here was the scene of Marquette’s mission, and here beneath the chapel of St. Ignace they laid his bones to rest. Here the intrepid La Salle, the brave Tonty, and the resolute Du Lhut had halted in their wild wanderings. Its palisades and bastions had echoed the war whoops of Ojibwas and Ottawas, of Hurons and Iroquois, and had been the scene of bloody massacres and of hard fought fights. At the conclusion of the war of 1812, after two centuries of struggle, peace settled at last upon the old fort and early in her reign celebrated one of the most famous of her minor victories—one which carried the high sounding name of Michilimackinac far and wide, and into circles where Marquette, Du Lhut and La Salle were unknown. Here in 1820, was assigned to duty at the fort which had been continued in use to keep the Indians in check, Surgeon William Beaumont, then a young man in the prime of life. On June 22, 1822, the accidental discharge of a musket riddled St. Martin, a *voyageur*—one of the most famous subjects in the history of physiology, for the wound laid open his stomach and he recovered with a permanent gastric fistula of an exceptionally favourable kind. Beaumont was not slow to see the extraordinary possibilities that were before him. Early in the second decade of the century the process of gastric digestion was believed to be due to direct mechanical maceration or to the action of a vital principle and though the idea of a solvent juice had long been entertained, the whole question was *sub judice*. The series of studies made by Beaumont on St. Martin settled for ever the existence of a solvent fluid capable of acting on food outside as well as within the

body and in addition enriched our knowledge of the processes of digestion by new observations on the movements of the stomach the temperature of the interior of the body, and the digestibility of the various articles of food. The results of his work were published in 1833 in an octavo volume of less than 300 pages. In looking through it one cannot but recognize that it is the source of a very large part of the current statements about digestion but apart altogether from the value of the facts there are qualities about the work which make it a model of its kind and on every page is revealed the character of the man. From the first experiment dated August 1 1825 to the last dated November 1 1833 the observations are made with accuracy and care and noted in plain terse language. A remarkable feature was the persistence with which for eight years Beaumont pursued the subject except during two intervals when St. Martin escaped to his relatives in Lower Canada. On one occasion Beaumont brought him a distance of two thousand miles to Fort Crawford on the upper Mississippi, where in 1829 the second series of experiments was made. The third series was conducted in Washington in 1832 and the fourth at Plattsburg in 1833. The determination to sift the question thoroughly to keep at it persistently until the truth was reached is shown in every one of the 238 experiments which he has recorded.

The opportunity presented itself the observer had the necessary mental equipment and the needed store of endurance to carry to a successful termination a long and laborious research. William Beaumont is indeed a bright example in the annals of the Army Medical Department and there is no name on its roll more deserving to live in the memory of the profession of this country.

And in closing let me express the wish that each one of you in all your works begun continued and ended may be able to say with him. Truth like beauty when unadorned is adorned the most and in prosecuting experiments and inquiries I believe I have been guided by its light.

Experiment and Observations on the Gastric Juice and the Physiology of Digestion.
By William Beaumont, M. D. Surg. Major and Surgeon Army Plattsburg 1833

The physician should write because writing is one of the disciplines of science because only by writing can he share his ideas with others because only by writing can he produce new ideas and intensify his own knowledge of his subject.

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A METHOD FOR REDUCING MAN-HOURS LOST IN EXTENSIVE DENTAL TREATMENT

DONALD L. COOK *Colonel DC USA*

SOL L. ORLEAN *Major DC USAR*

IN this era of manpower shortage, the problem of rendering dental treatment in the military services with a minimum time loss from the patient's duties must be considered of prime importance. Its solution is not simple because dental treatment is a personal service rendered by an individual to an individual. It cannot be mass produced. Although there are many avenues of approach to the solution of the problem, we are reporting only one—the oral rehabilitation of the young man inducted into the armed services with a dental disability.

The causes of this disability are commonly found to be generalized caries, abscessed teeth, poor oral hygiene and malocclusion. The result is "a dental cripple." The goal of oral rehabilitation is to make the serviceman a healthy link in an effective fighting force.

At this Army post where both enlisted and officer personnel attend schools for from 11 weeks to one year, it is imperative that their absence from classes be kept to a minimum. A large percentage of these men have had only two to three months of military service and are in the 19 to 22-year age group. In many instances the patient can only be rehabilitated orally by removal of his remaining teeth and replacement with either full upper and lower dentures or full upper and partial lower ones.

Previously surgical treatment of these patients extended over a period of from two to five weeks. The mouth was divided into tertians, quadrants, or sextants and a section was completed at each operation. After each operation the patient returned to his barracks for the day with the following written instructions:

1. Allow gauze pad to remain in place for 20 minutes after leaving clinic biting hard during this time then remove the gauze.

body and in addition enriched our knowledge of the processes of digestion by new observations on the movements of the stomach the temperature of the interior of the body and the digestibility of the various articles of food The results of his work were published in 1833 in an octavo volume of less than 300 pages In looking through it one cannot but recognize that it is the source of a very large part of the current statements about digestion but apart altogether from the value of the facts there are qualities about the work which make it a model of its kind and on every page is revealed the character of the man From the first experiment dated August 1 1825 to the last dated November 1 1833 the observations are made with accuracy and care and noted in plain terse language A remarkable feature was the persistence with which for eight years Beaumont pursued the subject except during two intervals when St Martin escaped to his relatives in Lower Canada On one occasion Beaumont brought him a distance of two thousand miles to Fort Crawford on the upper Mississippi where in 1829 the second series of experiments was made The third series was conducted in Washington in 1832 and the fourth at Plattsburg in 1833 The determination to sift the question thoroughly to keep at it persistently until the truth was reached is shown in every one of the 938 experiments which he has recorded

The opportunity presented itself the observer had the necessary mental equipment and the needed store of endurance to carry to a successful termination a long and laborious research William Beaumont is indeed a bright example in the annals of the Army Medical Department and there is no name on its roll more deserving to live in the memory of the profession of this country

And in closing let me express the wish that each one of you in all your works begun continued and ended may be able to say with him Truth like beauty when unadorned is adorned the most and in prosecuting experiments and inquiries I believe I have been guided by its light

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TABLE 1.—Patients treated on different status

Age (years)	Days hours fast	Number of teeth extracted	Number of visits for extractions	Number of visits postoperative treatment	Number of incomplete teeth	Alveolotomy performed	Postoperative analgesics
17	30	13	3	3	0	upper	M.F.S.
21	54	19	5	7	1	upper	MOD-F.S.
30	12	12	4	5	0	upper	MOD-F.S.
20	32	15	3	4	1	upper	MOD-F.S.
20	38	10	4	3	0	upper	M.F.S.
23	24	11	2	4	0	upper	MOD-F.S.
20	46	11	1	7	2	upper	S.F.V.F.S.
21	30	14	2	7	0	upper	S.F.V.F.
20	32	12	3	1	0	upper lower	M.F.S.
30	34	11	3	5	1	lower	MOD-F.S.
21	44	13	4	6	2	upper	S.F.V.F.S.
24	52	11	5	6	1	none	MOD-F.S.
30	60	14	5	10	0	upper	MOD-F.S.
21	42	10	1	5	0	none	MOD-F.S.
20	34	10	3	5	0	upper	MOD-F.S.
20	42	10	4	5	1	upper	MOD-F.S.
21	50	16	1	3	0	upper lower	S.F.V.F.S.

TABLE I P r e s e n t i n g i n f o r m a t i o n o n C o n t r o l

Age (y)	Dis- ability	N m b e r of trauma	N m b e r of injuries	N m b e r of patients	N m b e r of deaths	A l l o c a t i o n of patients	P a t i e n t category
19	40	14	5	5	1	pp low	MOD-ES
20	34	10	3	5	0		MOD-ES
38	38	14	4	3	0	low	MI-ES
19	56	22	5	8	2	pp low	STV-ES
20	36	11	4	7	0	pp	MI-ES
20	36	10	3	6	0	pp low	MOD-ES
21	40	14	4	4	0	pp	MI-ES
21	54	28	5	7	0	upp low	MOD-ES
30	50	19	5	5	0	upp	MI-ES
23	32	16	3	4	0	upp low	MI-ES
23	22	13	2	3	0	upp low	MI-ES
21	30	11	3	4	0	pp	MOD-ES
21	54	10	5	7	2	pp	STV-ES
20	54	12	5	7	2	upp	STV-ES

TABLE I *Patients treated on outpatient status—Continued*

Age (years)	Duty hours lost	Number of teeth extracted	Number of visits for extractions	Number of visits postoperative treatment	Number of impacted teeth	Alveolectomy performed	Postoperative sequelae
20	54	17	5	7	1	upper lower	MOD LS
21	38	10	4	3	0	upper	MI ES
20	58	22	6	5	1	upper lower	MOD-ES
21	46	12	4	7	0	upper	SEV ES
20	36	12	4	2	0	upper	MI LS
25	32	11	3	4	2	lower	MI ES
21	74	10	8	5	0	none	MI ES
20	38	13	4	3	0	upper	MI ES
20	40	12	4	4	0	upper	MI ES
21	32	10	3	4	0	upper	MI ES
20	52	22	5	6	1	upper	MOD-ES
20	36	9	4	2	0	none	MI ES
20	56	18	4	12	2	upper	SEV LS
21	66	30	6	9	0	upper lower	MOD-ES
23	28	13	2	6	0	upper	MOD-ES
19	28	9	3	2	1	upper none	MOD-ES MI ES

TABLE I Postoperative follow-up

Age (y)	Days hospital	No. of patients transferred	No. of patients lost to follow-up	No. of patients transferred	No. of patients lost to follow-up	No. of patients lost to follow-up	Alcohol consumption	Postoperative sequelae
21	54	20	5	7	1	pp r	MOD-ES	
20	24	13	2	4	0	ppe	MI FS	
21	36	16	3	6	2	upper r	MOD-ES	
20	44	12	4	6	3	pp low	MOD-ES	
20	62	24	5	11	0	upper lower	MOD-ES	
Total	2196	734	206	280	30			
Average	42.2	14.1						
Cybernetics	my	bf	ra	MI MOD SEV	MI MOD SEV	E E hym	S Sw H g	

clinic Under local anesthesia, extraction of the teeth was completed Because of the age group involved, the maximum amount of alveolar bone was conserved to permit the satisfactory construction of dentures Postoperatively 300,000 units of penicillin was given every six hours for 48 hours beginning at 1500 hours Ice packs were applied to the face 30 minutes out of every hour, and a warm saline mouthwash, starting eight hours after operation, was used every two hours The patient was placed on a soft diet and given 16 mg of morphine sulfate or 100 mg of meperidine hydrochloride (demerol) for pain and 0.1 gram of secobarbital sodium (seconal) for sleep

Saturday If the patient's temperature was normal, he was allowed to get up, although all meals were taken on the ward

Sunday The patient was ambulatory and all meals were taken in the mess hall

On *Monday* morning the patient was discharged to duty Postoperative treatment was continued on an outpatient basis from 48 to 72 hours later, and the sutures were removed at this single visit.

This method resulted in excellent postoperative convalescence and healing with minimal swelling, discomfort, and pain The patient received adequate diet and rest to overcome possible shock, and was able to concentrate on his studies at the start of the next school week and to make up the lessons he had missed Each patient was pleased to have had his dental treatment completed in this manner because fear had been the principal deterrent to treatment in civilian life The minimum loss of duty hours from school classes was eight hours and the maximum was 56 hours for any one patient (table 2)

To compare the two methods, a means for scoring duty hours was devised to evaluate the dental visits in the number of duty hours lost A value of an eight-hour duty loss, or one duty day, was placed on a visit when teeth were extracted and a two-hour loss for each postoperative visit. This method of evaluation was based on the premise that the loss of duty hours, not of off duty hours was what counted

Because Saturday and Sunday are normal off duty days at this post the actual duty hours lost while the patient was hospitalized would be on Thursday and Friday If an alveolectomy, frenectomy, cystectomy, removal of impacted teeth, or antrum closure were performed during operation under either method it was not included in the scoring, as these would average the same

TABLE 2 Patients treated at the hospital with a single postoperative visit to the dental clinic

Age (years)	Duty hours lost	Number of teeth extracted	Number of impacted teeth	Alveolectomy performed	Postoperative sequelae
21	42	20	0	upper lower	MOD-LS
19	42	14	1	upper lower	MOD-ES
20	34	19	1	upper	MOD-ES
20	26	15	0	upper	MOD-ES
21	26	20	0	upper lower	MOD-ES
22	18	17	0	upper	MI-S
20	18	12	0	upper	MI-S
20	18	15	0	upper	MI-S
21	26	17	0	upper	MOD-ES
20	26	13	0	upper	MOD-LS
20	18	9	0	upper	MI-S

TABLE 2 Patients treated in the hospital with a single postoperative visit to the dental clinic—Continued

Age (years)	Duty hours lost	Number of teeth extracted	Number of impacted teeth	Alveolectomy performed	Postoperative sequelas
20	18	14	0	upper	MI S
20	18	17	2	upper	MI S
20	18	20	0	upper lower	MI S
20	18	18	0	upper lower	MI S
20	18	14	0	upper	MI S
20	18	16	1	upper lower	MI S
20	18	18	0	upper	MI S
20	18	14	2	upper	MI S
20	18	22	1	upper	MI S
20	18	18	0	upper	MI S
20	18	14	0	upper	MI S
20	18	12	0	upper	MI S

TABLE I—Treatment of the hospital with a single post denture visit to the dental clinic continued

Age (year)	Duration (hr)	Number of teeth extracted	Number of inserted teeth	Alveolar process	Postoperative sequelae
5	45	1	5	upper lateral	abscess
20	15	5	0	upper	none
20	15	5	2	upper lateral	abscess
20	15	1	0	upper	abscess
1	15	5	3	upper lateral	abscess
20	15	17	0	upper	abscess
5	10	5	0	upper lower	abscess
20	15	16	3	upper lower	abscess
19	2	10	0	upper	abscess
19	15	15	0	upper lower	abscess

TABLE 2 Patients treated in the hospital with a single postoperative visit to the dental clinic—Continued

Age (years)	Duty hours lost	Number of teeth extracted	Number of impacted teeth	Alveolectomy performed	Postoperative sequelae
19	18	31	4	upper lower	MI ES
23	10	13	0	upper	none
21	18	32	4	upper lower	MI ES
22	18	14	4	upper lower	MI ES
21	18	13	1	upper	MI S
20	18	14	0	lower	MI S
21	18	14	0	lower	MI S
20	18	15	0	upper	MI S
21	18	11	0	upper	MI S
20	34	27	1	upper lower	MOD-ES
20	18	9	1	upper	MI S

TABLE 2 Patients treated in the hospital with a single postoperative visit to the dental clinic—Continued

Age (years)	Duty hours lost	Number of teeth extracted	Number of impacted teeth	Alveolectomy performed	Postoperative sequelae
21	34	16	2	upper lower	MOD-ES
21	26	13	0	upper	MOD LS
37	18	14	0	upper lower	MOD S
20	18	29	0	upper lower	MI S
24	18	23	0	upper lower	MI S
20	18	13	1	upper	none
26	18	15	0	upper	none
20	18	17	1	upper	MOD-ES
Total	1 104	893	42		
Average	21 2	17 1			
W P 1 d f b NI M d E L hym S V S e MOD M d S Sw II #					

CONCLUSION

The co-operation of medical and dental facilities in extensive oral surgical procedures at military posts, camps, and bases contributes much to the welfare of the patient and will result in a 50 percent reduction in the duty man hours lost due to extensive dental treatment.

Nurses at Thule Air Force Base Are Only 900 Miles From Pole



The three U S Air Force nurses stationed at Thule Air Force Base in Greenland who are only 900 miles from the North Pole are shown during a recent visit by Major General Harry G Armstrong Surgeon General of the Air Force. Dressed for the Greenland weather left to right are Captain Sophia Schadt USAF (AFNC) Colonel Lee F Ferrell USAF (MC) Surgeon Northeast Air Command First Lieutenant Helena M Costa USAF (AFNC) General Armstrong and Second Lieutenant Christina A Stevens USAF (AFNC).

LENGTH OF PATIENT STAY IN ARMY HOSPITALS

WILLIAM S MOORE *Col 1 MC USA*
CHARLES J SHIVELY *May MSC USA*

THE length of patient stay in Army hospitals is a subject of continual concern to the Medical Service. In the interests of efficiency, economy, and maximal use of personnel and facilities, it is necessary that every action possible be taken to eliminate those factors which may contribute to prolonged length of patient stay and to unnecessary hospitalization. For the purpose of this article, the term "prolonged length of patient stay" refers to that portion of bed occupied time over and above that required for professional treatment. (It results from administrative practices and procedures that tend to delay treatment and disposition of the patient.) The term "unnecessary hospitalization" refers to the admission of patients to the hospital or their retention in a bed occupied status when they require no treatment or when they could be treated as outpatients without detriment to their health.

For the past two and one half years this problem has been the subject of several studies in this office. In 1950 representatives of the Bureau of the Budget and the Department of Defense participated jointly in a study of the problem as a result of which the stay of military patients in Army hospitals over and above medical necessity was estimated as about 20 percent of the total bed occupied days. This survey was not, however, representative of the patient load in the continental United States because no station hospitals were included in the survey. Such hospitals have a preponderance of short-term local patients whose disposition is attended by a minimum of administrative delay.

SURVEY RECOMMENDED BY BUREAU OF THE BUDGET

In July 1952 representatives of the Bureau of the Budget recommended that a survey be conducted to determine the current percent of excess length of patient stay attributable to administrative procedures. This survey was conducted by representatives of the Surgeon General's Office in August and

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September In order that a more representative sample of the patient load in the Army hospital system in the United States might be obtained, two general hospitals two station hospitals which have also been designated as specialized treatment centers, and three station hospitals providing only post medical care were selected for the survey Although the over all results of the 1950 and 1952 surveys are not comparable, comparison of the results obtained at the only general hospital included in both surveys indicates a great reduction in that part of patient stay due to administrative procedures At this hospital, excess stay was estimated to be 20 percent in 1950 and about 12 percent in 1952

TABLE 1 *Summary of survey of length of patient stay
(August and September 1952)*

Number of patients included in survey	707
Assigned patients	73 (10.3 percent)
Attached patients	634 (89.7 percent)
Bed-occupied days	15,939
Assigned patients	6,890 (43 percent)
Attached patients	9,049 (57 percent)
Bed-occupied days due to administrative delay	1,228
Assigned patients	846 (69 percent)
Attached patients	382 (31 percent)
Average number of days delay per patient	1.7
Assigned patients	11.6
Attached patients	0.6
Average duration of hospitalization in days	22.5
Assigned patients	94.4
Attached patients	14.3
Percent of bed-occupied days due to administrative delay	7.7
Assigned patients	12.3 percent
Attached patients	4.2 percent

Table 1 summarizes the results of the 1952 survey. Delay incident to the processing of patients by physical examination boards were not included because the responsibility for such boards does not rest with the hospital command. In speaking, "assigned patients" are those who have been assigned to the hospital for treatment.

pitalized in excess of 90 days or who require processing for disability separation by means of a physical evaluation board. The hospital has almost complete administrative responsibility for assigned patients and many complex administrative problems may be encountered in effecting their disposition. The attached patients " on the other hand are those for whom the hospital has little administrative responsibility and who may be returned to their organization on completion of medical treatment with a minimum of administrative work. They remain assigned to their organization and are only attached to the hospital for the purpose of receiving medical care.

AREAS OF DELAY CAN BE REDUCED

Although little delay was experienced in returning the short-term (attached) patients to duty on completion of treatment there are three major areas of delay which can be effectively reduced. These consist of (1) delays of from one to three days in effecting a return to duty (2) preoperative delays in elective surgical procedures and (3) retention in a bed occupied status when no further treatment is required or admission to the hospital for conditions which could have been treated on an outpatient basis (mostly patients admitted to the hospital for evaluation prior to separation for conditions which existed prior to service those who were being separated for administrative unfitness when such action was not medically indicated or those who were retained for completion of routine dental work results of special examinations et cetera).

Adequate corrective measures which may be used at the hospital or installation level for most of the delays in discharging attached patients are provided for in existing directives and Army Regulations. It appeared that these delays existed primarily because such directives were not fully implemented at the hospitals concerned.

REASONS FOR PROLONGED STAY

To discover the major reasons for prolonged length of patient stay and unnecessary hospitalization we must look to the long term (assigned) patients. One important problem area involves the return of these patients to duty. For patients in this category it is necessary to secure duty assignment instructions from the Adjutant General. The primary cause of their prolonged length of stay is the failure on the part of the ward officer to anticipate their return to duty so that assignment instructions may be obtained prior to the scheduled date of release from the hospital and concurrent with the final stages of treatment. A recent change to regulations pertaining to the assignment of patients provides that in the event reassignment instructions have not

been received by the time hospital treatment is completed, the patient will be placed on temporary duty with the hospital duty detachment or with an Army organization at or near the hospital for the performance of duty until reassignment instructions are received. This removes him from a bed-occupied status although he continues to be carried as a "remaining" patient. The hospital commander's efforts to eliminate the delay involved in securing reassignment instructions from the Adjutant General should, however, emphasize the anticipation of return to duty rather than the provisions for temporary duty.

Necessity for securing previous records It was also noted in the survey that appearance before a medical board and physical evaluation board for disability separation processing has been delayed in some instances as long as two months because of the necessity of securing previous medical records from the Adjutant General. In many cases, however, investigation revealed that ward officers did not submit a request for such records as soon as they had reasonably ascertained that the patient would require the action of a board. It is realized that when the period of necessary observation and treatment prior to the action of a physical evaluation board is short and previous medical records are required, some delay will still result, even if all possible action under existing regulations is taken by the hospital concerned. This matter is currently under study by the Surgeon General and the Adjutant General with a view toward reducing the time required to secure such records.

Transfer to convalescent or holding stations Another problem contributing to prolonged length of patient stay involves convalescent patients and patients awaiting administrative processing who have completed treatment. At most hospitals such patients are transferred to convalescent or holding sections and in some instances these patients tend to become "lost" or overlooked. Responsibility for these patients should be clearly defined. A periodic check of these patients is essential.

Administrative delay The appearance of patients before a medical board prior to disability separation processing is another cause of prolonged length of patient stay. The most frequent reason for this delay was the failure of the ward officer to complete the clinical record and prepare the clinical summary necessary for the medical board. Such delays were generally blamed on the heavy workload of the ward officers and the lack of adequate and skilled stenographic assistance. The action and processing of these cases must be assigned such priority as to insure their expeditious completion. Hospital commanders should consider the problem of inadequate stenographic assistance in

order that the best possible system may be adopted from the standpoint of efficiency and maximal use of personnel

SURVEYS RECOMMENDED

The Surgeon General has recommended that each Army hospital conduct a survey to determine the length of patient stay at least once each year. The object of such surveys is to determine what factors contribute to prolonged length of patient stay and unnecessary hospitalization in order that necessary corrective action may be instituted. It was further recommended that a summary of the findings of the survey be forwarded to the Surgeon General with a presentation of any specific problems that the hospital commander may care to include and his recommendations for corrective action. The description of these problems and the recommendations will be disseminated to other hospitals in order that all hospital commanders may take advantage of solutions evolving through such studies. The results of the survey including questionnaires completed are to be maintained at the hospital concerned for review by representatives of the Army Surgeon and the Surgeon General.

Army Surgeons have been requested to conduct similar surveys at all hospitals under the jurisdiction of their headquarters and surveys will be conducted at selected general hospitals by a survey team from the Surgeon General's Office. It is further contemplated that the survey team will conduct a survey at one station hospital within each Army area annually.

The survey conducted in 1952 revealed a lack of initial and follow up indoctrination of both professional and administrative personnel incident to the problems of prolonged length of patient stay and unnecessary hospitalization and their effects on costs personnel and materiel requirements. It was also noted that there was a reluctance on the part of some ward officers to assume their responsibilities pertaining to early disposition of patients concurrent with the completion of treatment. This duty is solely that of the physician concerned and includes preparation of clinical summaries anticipation of disposition follow up of convalescent patients and initiation of action to achieve early disposition of patients who are considered unlikely to return to duty. It was suggested that each hospital commander prepare a summary of those factors which were determined by his survey to contribute to prolonged length of patient stay and unnecessary hospitalization at his hospital. Such a summary could be used for the initial and follow up indoctrination of all assigned professional and administrative personnel and should outline the recommended corrective procedures.

ACTION BY SURGEON GENERAL

Much progress has been made and a study of all elements pertinent to the management of military personnel during any periods when they do not need hospital ward care has been started at Fort Belvoir, Va. Included are those patients who are either incapacitated for duty while undergoing diagnostic procedures or who must be retained under medical jurisdiction for administrative purposes.

Factors of a purely professional nature which may contribute to this problem are the subject of continuing study and review by the professional consultants and other professional personnel of the Surgeon General's Office. In a letter to each Army Surgeon, dated 10 November 1952, the Surgeons General recommended that representatives of the medical staff of the Army Surgeon's office review the factors contributing to length of patient stay when visiting hospitals of their command, with particular attention to patients who have exceeded one year of hospitalization. Representatives of the professional divisions and the Inspector General of the Surgeon General's Office have been asked to make a similar review when visiting general hospitals.

Hospital commanders should give their personal attention to this problem. All personnel concerned with the disposition and treatment of patients should be familiar with the pertinent regulations and directives. Patients should be considered by a medical board or referred to a physical evaluation board for recommendations regarding disposition within the time limits prescribed. Instructions for the early transfer to Veterans Administration hospitals of patients who are considered unlikely to return to duty and who require further hospitalization have been published in regulations and directives.

In any program encompassing a reduction in length of patient stay, medical officers must never lose sight of the primary mission of the Medical Service, namely, conservation of manpower. It is not the intent of such a program to minimize required medical care and treatment, or to preclude the use of sound professional judgment in any case. This program, however, is an important step in the economical operation of the Army hospital system.

Gastric and duodenal ulcers may follow sunburn as noted among sea bathers. Sunburn (also) causes toxicity, alters the hemic, chemical and cellular elements, disturbs normal metabolism and creates physical and mental suffering.

Army Surgeon General Addresses 38th Parallel Medical Society



Major General George E. Armstrong, second from left, Surgeon General of the U S Army, is shown with some members of the United Nations international medical team as he referred to them in an address he had just concluded on 17 January 1954 before the members of the 38th Parallel Medical Society in Korea. In the group at Headquarters I Corps U S Army, left to right are: Colonel Erik Thoresen, Commanding Officer, Norwegian Mobile Army Surgical Hospital; General Armstrong, Commander; George Donabedian, MC, USN, Commanding Officer, 1st Medical Battalion, USMC; Captain Milton F. M. Brohman, and Colonel J. S. McConnel, Royal Canadian Army Medical Corps. Brigadier General Stuart G. Smith, Surgeon, Eighth U S Army, and Nursing Sister Lieutenant S. Hill, Royal Canadian Army Medical Corps.

General Armstrong's latest trip to Korea was his fourth since the beginning of hostilities. He was accompanied to I Corps headquarters by Major General Earle Standlee, Surgeon, United States Army Forces Far East, where they were met by Colonel Ralph V. Plew, Surgeon, I Corps.

A PHYSICAL MEDICINE WARD IN AN ARMY HOSPITAL

DAVID RUBIN *Captain MC AUS*

ERNEST F ADAMS *Major MC USA*

NORMAN WILEY *Colonel MC USA*

WILLIAM R TORGERSON *First Lieutenant MC AUS*

MUCH has been written on the value of a total rehabilitation program in civilian life in restoring function and returning the disabled patient to a productive life physically, socially, and economically.¹⁻⁵ Equally important is the restoration and return of the war injured patient to a productive civilian or military life. Although the demands made on the individual will vary with the type of service, or employment, the rehabilitation program will be essentially the same for all except for the vocational and, in some instances, the psychological aspects. We have had an opportunity for several months to observe in a pilot study the value of an integrated program of physical treatment and psychosocial adjustment wherein the physical medicine service at Percy Jones Army Hospital was provided a ward with an adequate number of beds for patients requiring definitive physical medicine procedures to achieve functional recovery. Although a longer period of observation and study would have permitted a more thorough analysis of the value of this plan the impressions we formed are sufficiently promising to warrant a presentation of the advantages for possible future use in other military hospitals.

The new physical medicine unit consisted of a three-floor annex to the hospital. The ground floor was divided into three sections for (1) electrotherapy and heat treatments, (2) hydrotherapy, and (3) exercise and prosthetic training (fig 1). On the second floor were administrative and physicians offices, facilities for diagnostic aids such as electromyography and plethysmography, and the occupational therapy section (fig 2). The third floor consisted of a 45 bed ward with an attached recreation room and the physical reconditioning section and its administrative offices (fig 3). The construction and correction of appliances was conveniently located in the hospital brace shop.

From Percy J. Army Hospital, Belknap, Mich. Capt. Rubins, w. t. B. k.
Army Hospital, Fort Smith, Ariz. T.



Figure 1 Physical therapy section.

on the floor below the physical therapy section. The patients had ready access to the shop, the treatment sections and the ward by way of an automatic self service elevator. Prior to the opening of the physical medicine unit the chiefs of the hospital



Figure 2 The occupational therapy workshop.

services devised an operational procedure for the transfer to the physical medicine ward of patients who had received maximum orthopedic, neurosurgical, or surgical and medical treatment and required only continued physical medicine treatment for restoration of maximum function

PROCEDURE AND CORRELATION OF SERVICES

Each recommended patient was interviewed and examined by one of us, prior to acceptance for transfer to the physical medicine ward. If it was determined that the patient was in need of definitive physical medicine care, a transfer note was written and a prescription for treatment was outlined. Formal ward rounds were conducted weekly by the staff physiatrists accompanied by a representative from the physical therapy, occupational therapy,



Figur 3 The physical reconditioning section adjacent to the physical medicine ward

and physical reconditioning departments the medical social worker, and the noncommissioned officer assigned as wardmaster

The progress of each patient was reviewed in detail. The range of motion of affected joints was measured, the extent of return of muscle function was determined, further diagnostic tests were outlined as needed, and problems relating to daily treatment were discussed. The therapists raised questions relating to the daily treatment program and supplied invaluable information regarding motivation, response to treatment, co-operation of the patient, and other problems patients frequently discuss with them more freely than with the physician. The granting of passes, possibility of return to duty, vocational interests, prevocational training and personal problems were discussed, and appropriate disposi

tion or referral was arranged at the bedside. Personal problems requiring more detailed study and investigation were referred to the medical social worker. Bracing problems for peripheral nerve injuries, prosthetic appliance adjustments and shoe corrections were discussed and immediate recommendations made for their care. The wardmaster was also informed when a patient was ready for light duty about the ward or in the departmental sections. In this way the individual was gradually given responsibility compatible with his physical condition and his work tolerance was determined for eventual return to duty.

Each week orthopedic and neurosurgical rounds were conducted with a physician of the respective services to review recent roentgenograms and to discuss the patient's progress or lack of progress, future surgical procedures, possible return to duty, or presentation to a physical evaluation board. The exchange of ideas between physicians of the various services served to increase the scope and effectiveness of treatment and provide a continuous teaching-learning stimulus to the professional staff. The common goal of achieving the most rapid and complete rehabilitation of each patient was thus fostered and put into operation.

MOTIVATION OF THE PATIENT

Patients admitted to the physical medicine ward associated with other patients who like themselves, had residual conditions requiring only physical medicine treatment for the completion of the program designed to return them to useful activity. The rigid routine of medication, nursing, and complete or partial bed rest was no longer a barrier to the patient's desire to be mobile and to maintain a schedule of physical treatment aimed at restoring him to a self-sufficient and productive status. The competitive aspect of observing a similarly injured comrade engaged in the same program stimulated and encouraged each patient to greater and more persistent effort. As soon as feasible a patient was given a task commensurate with his physical ability. This was used as a work tolerance measurement and served to awaken a desire to contribute to the functioning of the ward and the various units within the physical medicine section. Work activities consisted of cleaning the whirlpool baths and Hubbard tanks, sweeping and mopping ward floors, latrine duty and dusting of ward furniture. Each patient was responsible for the care of his own bed and immediate bed area. The assigned duties did not interfere with treatment. Week end passes and convalescent leaves were granted on the basis of personal achievement in the treatment program which served to motivate the patient and in most instances stimulated his maximum effort and cooperation. Experience showed that in this type of wholesome atmosphere the patient developed greater interest and a more personal attach-

ment to his physician Patient doctor rapport and patient morale appeared higher and the patient exhibited a more intense desire to attain a definitive goal in the total treatment program Patients were outspoken in their expression of gratitude for the attention and interest centered upon them as a person Group affiliation coupled with individual attention satisfied the needs of almost everyone admitted to the ward The proximity of the patient to all of the necessary treatment areas saved his time for other activities

OBSERVATIONS

In three and one-half months of ward operation, 93 patients were admitted to the physical medicine ward to receive definitive treatment Of these, 75 received maximum benefit and were discharged to duty Several others received maximum benefit but, because of the nature of their disabilities, were discharged to a civilian status It was the consensus of the professional staff that patients achieved maximum benefit and returned to duty in a shorter time, with greater confidence and a more thorough understanding of their individual problems and residual disabilities than previously had been possible The experiment has been successful and interesting, and is worthy of further observation and study

CONCLUSIONS

We believe that attainment of specific treatment goals and return of patients to duty status is accomplished more efficiently and effectively by a unified approach to rehabilitation through the establishment of a separate physical medicine ward Greater patient control with immediate attention to specific problems is facilitated The distractions of medical or surgical ward routine are avoided, and each patient can expend all of his time and energy in achieving a medically prescribed goal leading to rehabilitation In this way the conservation of fighting strength is achieved more rapidly without sacrificing the individual needs of each patient

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Womble Report, Hannah Letter of Interest to Medical Officers

The report of the Womble Committee published on 30 October 1953 outlined a course of legislative action in its recommendations designed to make the military service more attractive as a career. The report was widely quoted by both the lay and military press. Recently Assistant Secretary of Defense John A. Hannah, in a letter on 8 January 1954 to the Honorable Dewey Short, Chairman of the Committee on Armed Services of the House of Representatives, described some of the problems of career officers in the military services, and offered suggestions for their solution. Following is the complete text of Mr. Hannah's letter.

Dear Mr. Chairman:

The opportunity which your letter of 26 October 1953 affords the Department of Defense to comment at length on recent developments regarding the conditions of service of military personnel is greatly appreciated. It is fully agreed that these problems are of fundamental importance and that their solution calls for our detailed consideration and study.

Present difficulties of the armed forces with which you are of course familiar stem primarily from current world conditions. The United States is not at war nor at peace. We are simultaneously mobilizing and demobilizing large temporary forces every two years. Almost half of our forces are deployed overseas. These are conditions which this country has never before had to meet. They may continue for years.

The armed forces have peacetime military personnel career policies designed to provide and train during time of peace highly qualified professional military personnel to mobilize and lead large temporary forces. During wartime these policies are largely superseded by others specifically designed to aid in bringing military operations to the earliest possible conclusion. Neither peacetime nor wartime personnel career policies suit our situation today. We must proceed to make the changes required to meet current conditions. It is heartening to know that you and your Committee are preparing to lend your indispensable assistance to this effort.

In compliance with your request the conclusions and supporting facts of the Hook Commission concerning service benefits (considered as part of pay) are forwarded herewith. The Commission concluded that special emoluments such as medical attention etc. are balanced out by the special expenses incurred by officers due to their service.

A comparative analysis of the differences in the pay and benefits received by Foreign Service officers and those received by armed forces officers emphasizes the fact that our present military career policies are not adapted to the situation today. The Foreign Service officer must by the nature of his employment make frequent changes of station and spend many years in oversea assignments. The Congress appears to have recognized that the Foreign Service officer is entitled to a normal family life and a relatively stable income and that any unusual expenses required to provide these benefits to him at any particular station should be borne by the Government (with the notable exception of paying for the education of his children). This appears only just since the Foreign Service officer's assignment reflects the needs of the country and is not a matter within his own control.

An armed forces officer's peacetime assignments were relatively stable between World War I and World War II. During this time tours of four and five years at one station were common. Oversea assignments were few and an officer's family could accompany him. Unusual expenses occasioned by changes in assignment were relatively infrequent. These conditions do not obtain today and may not return for many years. Now armed forces officers must make frequent changes of station and serve much time overseas. They are separated from their families for long periods. It is to be hoped the Congress will recognize the justice of safeguarding military personnel as well from family separations and monetary losses resulting from an assignment which again is not a matter within their control.

An examination of the legal benefits accorded those in the regular service as opposed to the legal benefits accorded those in the reserve components reveals that in several important matters it is greatly to the individual's advantage to leave the regular establishment for the reserve components. The astonishing difference between the benefits paid the widow of a reserve over those paid the widow of a regular is most striking. However and perhaps equally important to the maintenance of a strong regular establishment is the fact that the two GI bills whose benefits are denied to regulars in effect offer an immediate inducement to individuals to leave the military for civilian life. This incentive to leave the military service can be neutralized to some extent by allowing regulars to qualify for benefits of these bills. No substantial expense to the Government should be involved since at present these benefits are merely deferred until the regular's retirement.

The study of current officer retirement provisions in particular the lessened expense for pay and allowances to the Government of allowing

an individual to retire voluntarily after 20 years service rather than retain him for 30 years is of particular interest at this time when it appears that a reduction in the strength of the armed forces may become a reality. Often an immediate reaction is that it would be throwing money away to train an individual at Government expense for 20 years and then just when he presumably is entering his most productive period allow him to retire. However on reflecting that such an individual's services would remain available to the country in time of emergency and noting that by spending somewhat less money for pay and allowances the country could train three men in place of two and considering that a man retired after 20 years would still be young enough to make a valuable contribution to the civilian economy it is possible to conclude that it would be to the long run advantage of the country not only to permit but perhaps to encourage voluntary 20 year retirement.

Detailed information covering the specific questions posed in your letter is attached as enclosure 1. The Secretary of State has extended his complete cooperation in the preparation of this material.

Recommendations as to legislation remedying defects will be found in enclosure 2. As indicated some items have been coordinated with in the Department of Defense but have not been cleared by the Bureau of the Budget for conformity with the program of the President others are in the process of Department of Defense coordination. There will be additional recommendations forthcoming as a result of study which will be forwarded to you when prepared.

The attached material demonstrates that appropriations riders have modified and in some cases negated many incentives to a military career which were authorized by carefully considered legislation. Your Committee is of course familiar with the congressional action concerning commissaries. It is considered that had the matter of armed forces commissaries received the same judicial attention as the Philbin subcommittee gave the armed forces exchanges the action of the Congress on this matter would have been quite different. The same is true with respect to riders affecting messes, shipment of household effects, voluntary retirement, employment restrictions and educational provisions. It is hoped that the Congress during this forthcoming session will review all appropriations riders which have the effect of modifying permanent legislation with a view toward embodying them in permanent legislation if they are determined to be justified or deleting them from future appropriations acts.

Sincerely yours

John A. H. H. H.

Official Decorations

SILVER STAR

Ed d L Farrar Lt (1g) MC USNR

James R H ersma Lt (1g) MC USNR

LEGION OF MERIT

L wyd W B llantyn Col USAF (MC)

R bert F Bell Lt Col MC USA

Cal i T Do dna Comd MC USN

Henry C Harr ll Col MC USA

V na d R Jackson Comd DC USN

Rich rd Lawrence Jr Comdr MC USN

Horace G Love J Lt MC USNR

Frederick A Rodewald Maj USAF (MSC)

Carl W R mpf Col MC USA

Frank C Spe c r Lt (1g) MC USNR

BRONZE STAR MEDAL

Robert M Ad m Lt (1g) MC USNR

B rnard C. A nberg 1st Lt MSC USA

Nora P B rry 1st Lt MC USA

C lo M Ber c l Capt MSC USA

O d L Bledsoe Capt MC USA

Edga S B wef nd Jr Capt MC US 1

J s ph T Brady Maj MSC USA

J h W Brophy 1st Lt MC USA

H rv y E B w Jr Capt MC USA

D lma W Cald w ll Maj MC USA

Phil p A C nal Comd DC USN

By n D Caste l Lt Comdr MC USN

Fra klyn D Chur h Lt (1g) DC USNR

J mes R Cl k Maj MSC USA

Da t n E Clem s 1st Lt MC USA

R bert I Cochran C pt DC USA

J h J Clema Maj MSC USA

V holas S C mitos 2d Lt MSC USA

M lt Coop Lt (1g) MC USNR

L J Cor z 1st Lt MC USA

Tim thy J Curra Capt MSC USA

R be t J D Capt MSC USA

Th ma D Da i C pt MC USA

Ed a d J D N olais Capt MC USA

J me B D bbl Lt MC USNR

Marv n J Eak 1st Lt MSC USA

G P E dly Capt MC USA

Edw F ldma Capt AC USA

Jam P Fick, 1st Lt MC USA

Robe t J Fl chak Lt MC USN

R F Fortuno-Carm 1st Lt MC USA

Sam el R Fraz i r 1st Lt MC USA

J mes W G lloway 1st Lt MSC USA

D E G bbi Capt DC USA

Jay W Gilbert 1st Lt MSC USA

M l U Gold t i 1st Lt MSC USA

Edward W Gre Lt (1g) MC USNR

P ul F Grysk Lt (1g) MC USNR

Lou C Hall Capt MC USA

M t E Ha l y 1st Lt MSC USA

Cha l s A H r i Capt MSC USA

Phil p W H uman Capt MC USA

J m s R Hin s Capt MC USA

Way E H d Lt (1g) MC USNR

Harry L H fma Lt MC USN

H rry N Hoffma 1st Lt AC USA

Thoma E Howard 1st Lt MSC USA

Joh J Ima io 1st Lt MC USA

Frank K Inui Capt MC USA

G n J bs 1st Lt MC USA

A n B J hns 1st Lt MC USA

R cha d E Jon Capt MC USA

H rold L Kemp 1st Lt MSC USA

John H K nedy Lt MC USNR

R be r W k mball Lt (1g) MC USNR

J me L K gsl d Maj MC USA

Oak L f Clust

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—Ed tor

BRONZE STAR MEDAL—Continued

Joh L K g	1st Lt	MC USA	R be t M S h y l	1st Lt (ig)	MC USNR
R lph K t ff	1st Lt	MC USA	Th ma M Sh	1st Lt	MC USA
J h M Lamp	1st Lt	MC USA	F kl G S	M ;	MSC USA
L M L y Lt		MSC USN	H rv y l Sl dkus	1st Lt	MSC USA
B na d K L	C pt	MC USA	Franc D S yd	Capt	DC USN
A th y M calus	May	MC USA	J m E Spa ks	Lt (ig)	MC USNR
Phil p M	M ;	USAF (DC)	R be k Sp	1st Lt	MC USA
Edw D M M	Lt C I	MSC US 1	Cha l N St	1st Lt	MSC USA
B y E M R	J	1st Lt	L B S ll	1st Lt	MC USA
L P Mddl ma	1st Lt	DC USA	I mu S T h ma	Capt	MC USA
G org T Mur y J	1st Lt	MSC USA	A ce W Th mp	M ;	MC USA
W l y R N w ll	C pt	USAF (MSC)	Orl d L T	WOJG	MC USA
W ll L Ostby	C pt	MSC USA	P ul K Tuck	1st Lt	MSC USA
R th F P	Capt	MC USA	Cl k W V t	C pt	MC USN
L F P f	Lt (ig)	MC USNR	Jos ph M W d	Lt (ig)	MC USNR
G Ram D Ar la	1st Lt	MC USA	J ph B W g	1st Lt	MSC USA
J h C R l	C pt	MSC USA	W N W h l	Capt	DC USA
Th ma F Rus	1st Lt	MSC USA	K nn h R W l	1st Lt	MSC USA
W ll m L S ylor	2d Lt	MSC USA	Ar hur W Y	1st Lt	MC USA

COMMENDATION RIBBON

Alb rt D Al xa d	C mdr	DC USNR	W lbur L L hma	Lt (ig)	DC USN
El D Ar ldy	C pt	MSC USA	M S L T ll	C pt	MC USA
R be G Ba k m	Cat	DC USA	G org N Lew	Lt	MC USNR
Irv g H Bahd J	2d Lt	MSC USA	S l m E L f	M ;	USAF (MC)
R be t J B f d	C I	USAF (MC)	W l H M h	2d Lt	MSC USA
Th ma J B	C pt	MC USA	R be G M y	Capt	MSC USA
W ll m D B lb w	1st Lt	MSC USA	V W M Cl na h	C pt	MSC USA
Lloyd F B kma	1st Lt	MSC USA	Phil p S M G h	Lt (ig)	DC USN
Ha ld C B w	CWOHC	USN	D nald H M kl	Capt	USAF (MC)
J h A Byrd	Lt (ig)	MC USN	Thaye K Mor w J	Lt (ig)	MC USNR
N h l V Ca ll	C pt	MSC USA	H ld R N	Lt (ig)	MC USNR
E l H Chr	C I	USAF (MC)	R g W O N ll	C mdr	MC USN
B ve ly R Cockr ll J	1st Lt	MC USA	Orr ll K Ow	WOHC	USN
Ll w lly W Coope	Lt	AC USNR	Edwa d E P k	Lt (ig)	MC USN
Phil p A D ll	May	MC USA	Albe W P	2d Lt	MSC USA
F nc A. DeMir	Capt	DC USA	L E P	Capt	MC USN
R be t P D bb	Lt (ig)	MC USN	H nry R l J	Lt	MC USNR
R be L Dow	Lt (ig)	MC USN	Ell P R g by	Lt C I	USAF (MC)
H nry B E berg	C mdr	MC USN	Lloyd C R hr	Lt (ig)	MC USNR
W ll C Ell b oek	Lt	MC USN	J m C. H Rus ll	Capt	USAF (MC)
B na d H F b	Capt	DC USN	R be T Sch	1st Lt	MC USA
W lliam W F kl n	C I	USAF (DC)	M g S ot J	1st Lt	MSC USA
Fred k J F	J	C I	R be E Sm h	2d Lt	MSC USA
Fra k D F ll	Lt (ig)	MC USN	W ll m R S be ry	WOHC	USN
Joh L Garr	Lt (ig)	MC USN	W ll m A T p	Lt (ig)	MC USNR
Orr ll M Gr	J	Lt	Cl G V	C mdr	DC USN
W ll m H G ll dg	C mdr	MC USN	D nald L W g	1st Lt	MSC USA
G be l E H gr d J	1st Lt	MSC USA	W ll m H W l	1st Lt	MC USA
Gr J H yd	May	AC USA	Jos ph M W d	Lt (ig)	MC USNR
B na d I H ll	May	USAF (MC)	A th M W ll	Lt (ig)	MC USNR
D nald D H ll	Lt	MC USN	H na C W ll ms	CWOHC	USN
C l E J hns n	1st Lt	MSC USA	D nald O W g	Capt	MC USN
L na d S J hns n	M ;	MC USA	J me E Wood	Capt	USAF (MC)
S ph G K	Lt (ig)	MC USNR	Ol L You g	Lt	Comdr
J ne F Kl kne	Lt	MC USNR	F d k M Z nd l	Lt (ig)	MC USNR

A Message From the A M A

Despite the temporary lull in Selective Service activities, the Council on National Emergency Medical Service is still receiving a substantial number of inquiries concerning the extension of the "Doctor Draft Law" (Public Law 84, 83d Congress) which was enacted on 29 June 1953. In view of this interest a brief outline of the principle provisions of the law of interest to physicians already on active duty has been prepared for your information.

The measure as passed by the Congress and as signed by the President will

1 Extend the effective date of the "Doctor Draft Law" until 1 July 1955

2 Retain the maximum ages specified in existing law: registration, age 50, liability for induction, age 51

3 Continue in effect the four priorities established by existing law with the following amendments

- (a) All service performed since 16 September 1940 as an officer or as an enlisted man, with certain exceptions which will be outlined later, will be credited as service
- (b) The length of service required to qualify for priority 4 for doctors who were deferred or educated at government expense during World War II is reduced from 21 to 17 months
- (c) Establish the following new periods of service for men recalled to active duty or inducted pursuant to the Doctor Draft Law*

<u>Previous service</u>	<u>New period of duty</u>
9 months or less	24 months
9 to 12 months	21 months
12 to 15 months	18 months
15 to 21 months	15 months

* From the Council on National Emergency Medical Service of the American Medical Association. This view and position are not necessarily those of the Department of Defense.—Editor

(d) Removes the liability for induction or recall to active duty except in time of war or national emergency hereafter declared by Congress for those men in priority 4 who have had 21 months or more of service since 16 September 1940

4 Define active duty* and "active service" to include

(a) Full time duty in the active service of the United States since 16 September 1940 in the Army Navy Air Force Marine Corps Coast Guard or United States Public Health Service including reserve components

(b) Time spent during World War II in work of national importance by conscientious objectors

(c) Service performed before 2 September 1945 in the armed forces of countries which were allies of the United States during World War II

(d) Service performed as a physician or dentist by United States citizens employed by the Panama Canal Health Department between 16 September 1940 and 2 September 1945

5 Exclude from consideration as active duty* periods spent in a Navy V 12 or Army Specialized Training Program in a military internship residency or senior student program in military service for the sole purpose of undergoing a physical examination or while engaged in active duty for training entered into after 29 June 1953

6 Authorize the appointment of medical officers in grades commensurate with their professional education, experience or ability

7 Continue until 1 July 1955 the authority to provide the special pay of \$100 per month for doctors in the armed services

8 Authorize the commissioning of noncitizens of the United States as officers in the armed services

9 Terminate the reserve commissions of physicians taken into service by operation of the "Doctor Draft Law" at time of separation from active service or within six months thereafter provided they have served for 12 months or more subsequent to 9 September 1950 Upon completion of this same service medical reservists recalled to active duty will be given an opportunity to resign their commission Such persons whether registrants or reservists shall not be liable thereafter for recall or re-induction except in time of war or national emergency hereafter declared by the Congress

10 Re-enact the present provisions of law which permit the deferment of those persons who are essential to the national health, safety, and interest.

11 Authorize the national, state, and local medical advisory committees to the Selective Service System, in addition to their present authority, to make recommendations with reference to the deferment of (a) registrants engaged in residency training, (b) those serving on faculties of medical and certain other schools, and (c) those engaged in essential laboratory and clinical research

12 Extend until 1 July 1955, the authority of the President to recall medical reservists to active duty involuntarily

13 Be retroactive in effect Those men already in uniform who would have benefited from the new changes in the law will, upon filing an application, be eligible for release from service as soon as possible and in no event later than 90 days after the effective date of the Act (29 June 1953)

In considering the over all effect of the new law, it should be noted that the major changes involve greater recognition of prior military service The result is that a physician, by being able to take advantage of the various new provisions, may either (a) become exempt from liability for service (b) be placed in a priority less vulnerable to immediate call, (c) be subject to a reduced term of service or (d) effect a severance of military status within 90 days upon application or after the completion of his period of service by being either discharged or permitted to resign

First Aid in Civil Defense

Present-day concepts of first aid must be modified if the greatest possible number of injured individuals in a demolished city are to be helped The training of the first aider should be directed to the important phases of recognizing injury and treating it and to methods of maintaining morale and self-survival Particularly he should know how to manage shock hemorrhage fractures burns and wounds and the procedures in caring for these should be so thoroughly practiced by him that he cannot forget them under the stress of catastrophe

—EMIL S. DANISHEK, M.D.
in *Northwest Medicine*
p. 979 Nov 1953

Letters to the Editor

EARLY DEVELOPMENT OF ANTI G SUITS

To the Editor —On page 1714 of the December 1953 issue of the U S Armed Forces Medical Journal in the excellent paper by Dr John F Fulton reprinted from the Journal of the American Medical Association 153 482 488 Oct 3 1953 there appears the following sentence The pneumatic pressure suit developed by Captain John Poppen MC USN Prof F A S Cotton in Australia and Dr Harold Lampert in New Haven Conn and many others has served to give measurable and strategically significant protection for military pilots which I consider to be in error

Credit for earlier studies in the effects of acceleration and for the development of the pneumatic abdominal belt which was flight tested and rejected by the Navy in the early thirties as offering inadequate protection should certainly be assigned to Poppen but he was not an active participant in the later development and testing of the first Navy sponsored pneumatic anti G suits in 1941 1942 The two men mainly responsible for the first successful Navy anti G suits were Captain Thomas Ferwerda and the undersigned I believe that Poppen should have been assigned credit as a contributor to the development of the anti G suit because a modification of his original abdominal belt was incorporated as a component of the two types of anti G suits developed by Ferwerda and myself with the aid of numerous engineering consultants

Work had begun on the Navy's anti G suits before Dr Cotton's work came to my attention I had the privilege of talking with Dr Cotton when he visited this country which I believe was late in 1941 or early in 1942 His development was somewhat similar to ours but was much more cumbersome and employed a system of weights to actuate and to control the inflation To the best of my available information it was never given service flight test or acceptance Neither Ferwerda nor myself knew of Lampert's work until flight testing of the Navy development was nearing completion

Leon D Carson Captain MC USN
First Naval District Boston Mass

(Captain Carson's letter was referred to Dr Fulton whose reply follows—Editor)

To the Editor —I am very pleased that you have allowed me to see the letter of my good friend Captain Leon Carson about the early

development of anti "G" suits Captain Carson was one of the first to enter the field of active study of anti "G" devices as I indicated in my Heath Clark Lectures *Aviation Medicine in Its Preventive Aspects* Oxford University Press 1948 page 141 All of those interested in the field were especially grateful to Thomas Ferwerda who did more flight testing of the different types of anti G suits during the early years of the war than any other flying officer in this country I am very glad of the opportunity to correct what may perhaps rightly be regarded as a sin of omission

John F. Fulton M D
Yale University School of Medicine
New Haven Conn

Army Specialist Decorated for Nutrition Survey Among Koreans



Lieutenant Colonel Carl J. Koehn MSC USA left in a recent ceremony was awarded the Army Commendation Ribbon by Colonel W. K. Alston USA Commanding Officer of the Chicago Quartermaster Depot for his work in conducting a nutritional survey of the ROK Army and captured enemy prisoners. Colonel Koehn is liaison officer for the Army Medical Service at the Food and Container Institute of the depot.

Regular Medical Corps Officers Certified by Specialty Boards

American Board of Orthopaedic Surgery

The American Board of Orthopaedic Surgery was organized in 1934 to grant certification to physicians qualified in this specialty. The following 47 regular Medical Corps officers of the military services, according to the respective surgeons general, have been certified by this board:

R be D And Lt Col USA
J h D A bby Maj USA

Th ma S B n Lt Col USA
Jos ph W Ba h Lt Col USA
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Joh D Bl Lt Col USA
H bert E Block Lt Col USAF
R be W Boal Lt Col USA
Oral B. Bol ba gh Lt Col USA
E ne t A B Lt Col USA
J h J B na Lt Col USA
Robe S. B na Lt Col USAF

Chalme R Ca Lt Col USA
J h H. Cheff y Lt Col USA

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H ary M J hns Lt Col USA

F k P K uz Capt USA

R be F L gg Capt USA
W ll m B Lew Lt Col USAF

F nes C L be Lt Col USA

H be A. la k w tz Lt Col USN
H ld S McBurney Lt Col USA
Georg G McSha k Lt Col USA
J h W Mc call Lt Col USN
W l R M ll Capt USN

Dougl E Ramsey Lt Col USAF
O S R d Lt Col USAF
R lph E R ne Lt Col USA
S l g J R hey Lt Col USA
W ll m C. R l nd Lt Col USN
Carl M Ryl nd Lt Col USA

Albe t W Sh fl Lt Col USA
A gus W Sp l Lt Col USA
Cl lf ord A. S vens Lt Col USN
W ll m S Stryk Lt Col USA

Lloyd W T ylor Lt Col USA
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M l S Th mp Lt Col USA

V or B v Lt Col USA
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How ll E W gg ns Lt Col USN

Th ma D Yoc m Lt Col USN

This list is published by the American Board of Orthopaedic Surgery. The name of the officer certified by this board is published in the April issue of the Journal.

Publications by Officers of the Medical Services

Appel S B M J MC USA Gluck J L First Lt MC AUS Schlecker A A
Miller A Richman, S Spring C Goldman A F st Lt USAF (MC) Ro nbluth
M B and Kuppman H S C mpa t ff ct of adrenocortic t ph c hormo e ex
tract on blood glu in m *Acta endocrinol* 14 99-107 1953

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Surgeon* 114 29-31 J 1954

Armstrong H G M J Gen USAF (MC) Ac ide t pre ention i th Ai Force *M L
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BOOK REVIEWS

THE SURGERY OF INFANCY AND CHILDHOOD Its Principles and Techniques by *Robert E Goss* M D D Sc 1 000 pages 1 488 illustrations on 567 figures drawings by *Etta Piotti* W B Saunders Co Philadelphia Pa 1953 Price \$16

Since the publication of *Abdominal Surgery of Infancy and Childhood* by Ladd and Gross in 1941 surgeons have used that book as a guide and ready reference for the management of infants requiring surgical intervention Although it served its purpose for many years the steady progress in surgery of infants and children created a need for a single volume that would encompass the entire field of pediatric surgery including thoracic as well as abdominal surgery This current monograph on *The Surgery of Infancy and Childhood* has accomplished this purpose and presents factually and concisely the principles and technics of surgery of childhood which have been developed on the basis of years of experience by the staff of the Children's Hospital Boston Their carefully documented data covering a broad field of surgical experience has made it possible for the author to draw sound conclusions on which to base his recommendations for surgical management

The object of this book is first to describe the types of cases which have been treated to evaluate the surgical procedures employed and to determine which procedures produced the best results so as to improve the surgical service at Children's Hospital secondly to make available to the medical profession the information which he has obtained on the care of infants and children

The book contains 69 chapters covering special fields of surgery which are peculiar to infants and children The subject matter is presented in a readable and interesting style and the text is supported adequately by illustrations and figures There are many excellent drawings by Etta Piotti The book has an excellent index and there is an individual bibliography at the end of each chapter

This work is the outstanding contribution to the literature of surgery of infants and children The author and his associates deserve great credit for making available to the medical profession the wealth of their experience This book should be read by all physicians engaged in pediatric medicine and surgery

—D B KENDRICK Col MC USA

THE INSIGHT TEST A V bal P j t T st F P r onal ty Study by
H I D S g t Ph D 2 6 pag G & St tion I N w York
N Y 1953 P \$6 75

This book describes a projective method for the clinical study of personality. The first part of the book deals with personality theory, the test materials and their administration, the principal response dimensions and their scoring, and problems of interpretation. The second part provides illustrative protocols obtained from patients diagnosed as having schizophrenia, paranoia, hysteria, and obsessive compulsive neurosis. The remaining pages include tables of normative data and the test materials themselves.

The stimulus materials of the insight test are problem situation outlines to which the subject responds by telling what the leading characters did, why they did it, and how they felt about it. The author assumes that these responses reflect the needs, attitudes, feelings, and modes of problem solving characteristic of the subjects undergoing assessment. The items were devised originally to cover six arbitrarily chosen areas of conflict: family, opposite sex, social and friendship relations, vocation, religion, and health. Other items are used from time to time in dealing with special problems. The test is available in eight forms—two long ones and two short ones for each sex. It is designed for administration in either oral or written form, and its completion ordinarily requires about an hour. A skilled examiner can score, tabulate, and interpret the results in about 45 minutes.

Satisfactory rules for the achievement of objectivity in scoring and interpretation have not yet been devised. Hence, the quality of interpretation is said to depend upon clinical judgment and the "feel" which the skilled examiner acquires. A few psychometric studies of validity and reliability are reported, but these are based on small samples in which the distinguishing criteria are not very precise. Despite this, the available evidence warrants further effort along these lines. The author of the test seems refreshingly aware of these limitations when discussing the psychometric studies, but when she permits the reader to see her at work on the test productions of selected cases, the interpretations often seem to outrun the evidence at hand. Diagnostic signs are seen everywhere; nothing goes unnoticed. For example, scoring difficulties per se suggest new inferences. Discrepant findings are often more significant than agreements. Occasionally one may be scored for what he does not produce as well as for his actual productions. Overproductions, however, are distressful because there are no norms. If a patient objects to the test, it seems possible for the examiner to abandon the test materials altogether, wringing the interpretation from the objection itself. Perhaps this is what is meant by the acquisition of "feel," a concept admittedly difficult to communicate. The flavor of the whole procedure is strongly psychoanalytic.

—R. B. PAYNE, M. J., USAF (MSC)

ROENTGEN DIAGNOSIS OF THE HEART AND GREAT VESSELS by *Erich Zdansky M D* translated by *Lynn J Boyd M D* 1st American edition new enlarged revision 499 pages illustrated Grune & Stratton Inc New York N Y 1953 Price \$15.50

This well illustrated volume from the University of Vienna on the roentgen features of the cardiovascular system presents a different approach than the standard American texts on the subject. Reproductions of roentgenograms most of which are accompanied by line drawings illustrating their features are excellent and follow the trend of European texts in using reversal of the color values of the roentgenogram.

The section on the normal heart which includes the physiology and dynamics as well as anatomy of the heart is excellent. The discussion of the effects of exercise and the so-called athletes heart is more complete than that usually found on this subject.

Pathologic cardiac conditions found in pure and combined valvular lesions are logically discussed from the radiologic findings. Discussion of congenital anomalies and vascular lesions is complete and includes an especially good coverage of congenital anomalies of the aorta. The remainder of the cardiovascular system including the lesser circuit in cardiovascular disease is adequately considered. Cardioangiographic and cardiac catheterization findings are given in connection with the disease process in which they help.

This is a good reference work for the radiologist, cardiologist and internist — **H R OSHEROFF Col MC USA**

QUANTITATIVE PHARMACEUTICAL CHEMISTRY by *Glen L Jenkins Ph D* *John E Christian Ph D* and *George P Hage Ph D* 4th edition 534 page illustrated McGraw Hill Book Company Inc New York N Y 1953 Price \$6.50

This publication is primarily designed for academic use by students or instructors but certain subject material and essential procedures it contains make it also of value to the analyst. The book is divided into three parts: the general methods which cover basic analytical procedures such as volumetric, gravimetric and gasometric procedures; the special methods which include description of procedures concerned with specific analytical procedures as the assay of volatile oils, alkaloidal assaying and assay of enzyme containing substances; and the physicochemical methods applicable to pharmaceutical analysis such as specific gravity, pH, colorimetry, spectrophotometry, fluorophotometry, nephelometry, turbidimetry, viscosity measurements and electrolytic methods. The 126 typical procedures, 75 tables included, have been revised to conform with the *United States Pharmacopoeia* (14th revision) and the *National Formulary* (9th edition).

This book should be of interest to instructors and students of pharmaceutical chemistry, and to a lesser degree to those similarly concerned with pharmacy — **W H LEE Maj USAF (MSc)**

THE INSIGHT TEST A VALID PROJECTIVE PERSONALITY Study by
 H I D S a g t Ph D 276 p g Gr A St It I c N w Y k
 N Y 1953 P \$6 75

This book describes a projective method for the clinical study of personality. The first part of the book deals with personality theory, the test materials and their administration, the principal response dimensions and their scoring, and problems of interpretation. The second part provides illustrative protocols obtained from patients diagnosed as having schizophrenia, paranoia, hysteria, and obsessive compulsive neurosis. The remaining pages include tables of normative data and the test materials themselves.

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—R B PAYNE M J, USAF (MSC)

MOTHER AND BABY CARE IN PICTURES by Louise Zabriskie R. N. 4th edition. 244 pages 255 figure numbers and 11 tables J B Lippincott Co Philadelphia Pa 1953 Price \$3

This new edition has been entirely revised with many additions changes and new illustrations to meet the current trends in mother and baby care It should prove valuable both to new and prospective parents especially to the woman expecting her first baby The material is excellently presented in a nonscientific and comprehensive manner and is well written, accurate and up to date The information given on the most recent advances in infant and child care may be easily understood by any parent

The illustrations are appropriate and well done Deserving special note is the simple explanation, with illustrations of the Rh factor The pictures showing the mechanisms of labor and actual process of birth may be frightening however especially to the new mother Detailed illustrated directions are given for bathing dressing and handling the baby The author answers the many questions that mothers want to know in a reassuring manner and by so doing should eliminate numerous unnecessary phone calls to the doctor

While the book is written primarily for parents it should adapt easily and readily to the needs of practical nurses and is an excellent reference book for all nurses —P V O NEIL Lt. Comd NC USN

THE CONQUEST OF PLAGUE A Study of the Evolution of Epidemiology by L Fabian Hirst M D with a foreword by Lieutenant General Sir William MacArthur K C B M D F R C P 478 pages illustrated Oxford University Press New York N Y 1953 Price \$11

This book is neither a definitive textbook nor a history of plague epidemics The subtitle is a better clue of its contents which deal broadly with the evolution of man's concepts of the nature of plague In this sense it is a facet of the evolution of the science of epidemiology and in essence is a study of human beliefs about the origin of the malady from primitive eras to the international control of plague and the advent of antibiotic therapy

The book is divided into four parts The first part deals with the primitive concepts of the disease The second is a summary of modern research as to the nature of plague The third is a discussion of the epidemiologic implications of geography ecology of fauna in particular the rat flea in the spread of bubonic plague The final part deals with international and national control measures and the prevention of plague as well as modern treatment of the disease Each section is followed by an excellent bibliography

This book is written in facile style and will be of interest not only to the professional person but also to the intelligent layman It avoids involved technical discussions even in quotations from the technical literature and is interestingly illustrated and well indexed

—A J RAPALSKI Col MC USA

THE YEAR BOOK OF GENERAL SURGERY (1953 1954 Year Book Series)
 edited by E. A. Graham A. B. M. D. with a critical selection
 edited by Stuart C. C. H. M. D. 590 pages illustrated. The Year
 Book published in Chicago, Ill. 1953 Price \$6

In this book Dr. Graham continues his annual editorial custom of presenting a world wide selection of abstracts of outstanding papers on general surgery anesthesiology and related subjects which have been published within the preceding year. Articles on the same subject are grouped together for easy and quick reference. The 454 abstracts are well written and contain all important and salient points. Many of them are accompanied by excellent diagrammatic illustrations. In addition the editor has at the end of many of the articles parenthetically indicated his own views on the material presented particularly where he believes that some point needs to be emphasized or perhaps where a word of caution is needed.

This book will be of especial interest to all engaged in these special fields and to those working in research in the basic surgical sciences. One of the volume's greatest advantages is that it affords the reader access in condensed time saving form to the best material published throughout the world. The editor is to be commended for his annual contribution of this book which has consistently over the years been of such great value to all physicians in the field of surgery — D. R. SEWELL Col USAF (MC)

COLLECTED PAPERS OF THE MAYO CLINIC AND THE MAYO FOUNDATION
 edited by R. H. M. Hewitt M. D. A. B. Nevil M. D. J. B. R. M. S. D. J. M. R. E. Kama Ph. D. M. Katiba Smith B. A.
 C. I. M. G. mb. H. M. D. M. P. H. F. I. S. hm. dt. B. S. F. d. G. o. g.
 G. St. Iwell M. D. V. I. XLIV 1952 published J. 1953 786 pages
 illustrated. W. B. S. d. C. Philadelphia P. 1953 Price \$12

This volume is the latest of a series containing articles which have for the most part appeared previously in various medical periodicals and which represent only a portion of the literature produced by the Mayo Clinic during the course of a year. Some are printed in their entirety and others appear in abbreviated form. The papers are grouped according to subject matter and it is noted that there is a marked variation numerically amongst the various subheadings. As an example while there are 35 papers concerning the alimentary tract there are only four under the heading of Skin and Syphilis.

The general level of the articles offered is high in interest and readability. While the majority are of the review type and cover some specific phase of the subject chosen a few present recent advances in therapy and diagnosis or the results of current clinical investigation. The general subjects of antibiotics and cortisone are particularly well covered and articles on these subjects appear under several of the topic headings. There is an excellent group of articles concerning the diagnosis and treatment of headache and mention should be made of those concerning gastric malignancy and of the single article by Mark B. Gerson on the problem of the painful shoulder.

While this volume is not meant to serve as a general reference it will be found useful to the general practitioner the diagnostician and the general surgeon as a convenient source of information concerning methods in use by one of the large clinics of this country. The volume will also be of interest to those whose practice is limited to some of the more restricted specialties —J E GORMAN *Comd MC USA*

FUNDAMENTALS OF BIOCHEMISTRY IN CLINICAL MEDICINE by *Niels C Klendshoj M D* 276 pages illustrated Charles C Thomas Publisher Springfield Ill 1953 Price \$7.75

As stated in the introduction this book should not be considered as a reference work but one that permits a reader in another field to obtain a brief review of the subject. Even bearing this purpose in mind it appears that too frequently a fundamental concept has been simplified to the point where the amount of useful information presented is overly limited. The style is informal and the author wanders freely from biochemistry to physiology and on to clinical medicine in correlating concepts. Although this book is brief it would seem that in seven chapters devoted to fundamentals of biochemistry the field of intermediary metabolism including tricarboxylic acid cycle coenzyme A et cetera would merit more emphasis. The inclusion of such topics as the biochemistry of vision and intracellular localization of biochemical functions would help bring the practitioner up to date in the vast expanding field of biochemistry. The clinical portion of the book is divided into four chapters on endocrine organs and one chapter each on the liver the kidneys bone disorders the nervous system and nutrition. A supplementary bibliography follows each chapter —B W AGRANOFF *Lt MC USNR*

LIVING WITH A DISABILITY by Howard A Rusk, M D and Eugene J Taylor in collaboration with Muriel Zimmerman, O T R and Julia Judson, M S 207 pages illustrated The Blakiston Co Inc Garden City N Y 1953 Price \$3.50

This book is distinguished by reason of its authors who are known for presenting interpreting and solving the problems of the physically handicapped person. Written with human interest and warmth the book presents concrete instructions on the art of living with a disability at home at play or at work. It is the first book for the physically handicapped and their families which presents information in a convenient concise and graphic form. It describes aids and approved methods for accomplishing activities of daily living such as communication dressing eating and travel homemaking work and other vital functions are described with clarity and detail. The book will prove helpful and interesting to doctors nurses and ancillary groups interested in the problem of physical rehabilitation. It is likewise a source of encouragement help and hope to the severely disabled and handicapped and opens to them new opportunities for physical independence by self-help through special arrangements appliances devices and aids.

SALMONELLAE AND SHIGELLAE Laboratory Diagnosis Correlated With
Clinical Manifestation and Epidemiology by *Alfred J. White* M.D.
d I a S phra M D 247 pag Il trat d Ch rl C Th m s P b-
li h Sp ngf Id Ill 1953 P c \$7 75

This book comprises a very complete presentation of the diagnostic procedures necessary for isolation cultivation and identification of bacteria of the salmonella and shigella groups. Primary emphasis necessarily rests on description and interpretive discussion of approved laboratory methods; however, the authors' treatment of the biologic position of these genera in relation to the other enterobacteriaceae furnishes sufficient basic information on physiologic processes and immunological behavior to provide an adequate technical background for thorough understanding of the laboratory manipulations described.

Extensive coverage is given of general biologic and immunological properties of these organisms, and the laboratory methods are explicit and easily followed by the reader. Such extremely complex phenomena as the antigenic variation encountered in these genera are discussed fully yet in simple and effective terms. Frequent citation of practical approaches to the problem of culture identification reflects the authors' extensive experience with these bacteria. The 35 tables and 14 illustrations summarize concisely much of the material presented in the text, and the bibliography cites extensively from the publications of outstanding workers in the field.

This book has considerable merit as supplementary reading material for students of bacteriology. It has unusual value as a laboratory aid for those workers whose activities entail frequent or regular encounter with the salmonellae and shigellae.—*F. L. DAVIS, Capt, USAF (MSC)*

CLINICAL ORTHOPAEDICS No. 2 by *Anthony F. D. Palma* Ed. t Ch. f
With the Assistance of *F. A. Ed. t* d B. d f S. Ad
ry Ed. t 247 pag Il trat d J. B. L. pp. tt Co Phil d l
ph P 1953 P c \$6

The purpose of this text—to present significant contributions to the advancement of surgical knowledge from original articles by various authors throughout the country—is successfully accomplished. The subject matter is divided into two sections. The first section, *intra-medullary nailing*, is well presented and covers the complications and errors, technique, infections, and use of intramedullary fixation. It is pointed out that this procedure should not be used by unskilled surgeons because many pitfalls might be overlooked by inexperienced surgeons.

The second section is on general orthopedics and has nine chapters including chapters on arthritis, bone grafting, and bone tumors, as well as other general orthopedic problems. This book is of value for orthopedic residents as well as orthopedic surgeons.

—*R. E. REINER, Col, MC USA*

NASH'S SURGICAL PHYSIOLOGY edited by *Brian Blades* M D 2d edition
686 pages illustrated Charles C Thomas Publisher Springfield Ill
1953 Price \$12.50

The purpose of this volume is to present simply and briefly those aspects of physiology which are of greatest importance in surgery. It accomplishes this effectively by presenting in a practical manner the basic physiology of interest to the student and surgeon. There are chapters on the circulatory system, the physiology of burns and tissue repair, the respiratory system, mechanics and control of the gastrointestinal system, vitamins in surgery, the physiology of body fluids and acid base balance, the kidneys, the endocrine glands, and the nervous system.

The subjects are well covered and most chapters are followed by an excellent bibliography. The indications for splenectomy set forth by the author are fewer than generally accepted by the profession. Although it is realized that not everything can be covered in any one volume, it is considered that the value of the section on nutrition and fluid balance would have been enhanced by inclusion of the Evans blue test and that of the section on the thyroid by inclusion of the protein bound iodine test as an index to the function of the thyroid.

The general excellence of the work makes it difficult to select portions for special comment, but the chapters on shock, respiration, nutrition, body fluids, and acid base balance are particularly good. This book is recommended to students, interns, residents, and surgeons for practical physiology upon which to base their surgical care of patients.

—E. S. LOWE, Capt. MC, USN

AN ATLAS OF SURGICAL EXPOSURES OF THE EXTREMITIES by *Sam W. Banks* M D and *Harold Laufman*, M D, Ph D 391 pages illustrated
W. B. Saunders Co. Philadelphia Pa. publishers 1953 Price \$15

The authors of this excellent volume have succeeded in producing a comprehensive descriptive atlas of surgical exposures of the extremities. The subject matter is divided into 11 sections, each dealing with the commonly used approach to a distinct region of the body. Each approach is succinctly described in outline form, with emphasis on the points at which vital structures are likely to be placed in jeopardy. Of the 374 pages making up the book, 176 are halftone plates to depict the important steps described in the text. The drawings have been well executed. Because they were made from anatomical specimens, the fault of appearing schematic and misleading the unfamiliar surgeon is avoided. The book is well bound and is printed on high quality glossy paper, so that it is both attractive and easily read.

Inasmuch as comparable works in most instances do not meet the high standard represented by this volume, it should prove to be a very welcome addition to all medical libraries.

HYPERPARATHYROIDISM by *B. M. d. Black M. D. Am. L. t. e.*
S. i. P. bl. tio N. 173 A. M. g. ph. i. Americ. L. tur. n.
E. do. i. logy. d. t. d. by W. H. d. O. T. b. mp. M. D. 119 pag. ill.
tr. t. d. Ch. l. C. Thom. P. bli. h. Sp. g. f. ld. Ill. 1953 P. \$3.75

The author's wide experience with this clinical problem is well expressed in his comprehensive and yet condensed presentation. Thorough consideration is given to the pathology, clinical aspects, diagnosis, differential diagnosis, treatment, and surgical procedures, including postoperative course and management of complications of this potentially fatal disease. Special emphasis is placed on careful medical evaluation of hypercalcemia to rule out nonsurgical, clinically similar disease states involving calcium-phosphorus metabolism. The surgical technic involved in cervical dissection and in mediastinal exploration when indicated is especially well stated, as is the management of the uncomplicated as well as the complicated postoperative course. A total of 19 figures, including excellent microscopic pathology, diagnostic roentgenograms, and surgical illustrations, adds to the completeness of this 93-page monograph. The bibliography consists of 112 references.

Dr. Black's monograph represents a very worthwhile addition to the present library of medical publications concerned with hyperparathyroidism and related diseases of calcium metabolism.

—A. ZIKMUND, C. p. i. MC USA

MECHANISMS OF UROLOGIC DISEASE by *D. d. M. D. V. D. 156 p. g.*
ll. trat. d. W. B. S. d. C. Ph. l. d. lph. P. 1953 P. \$4.50

This book was prepared from a modified and expanded syllabus originally begun as a series of introductory lectures to third-year students at Jefferson Medical College. The author, a noted authority and teacher of urology, has organized the material in this small volume on the basis of physiologic and pathologic processes involved in this specialty rather than on an anatomic basis, as is generally true in other text books of urology.

The subject matter is covered under the eight headings of obstruction, infection, stone formation, neoplasm, congenital malformation, trauma, foreign body, and neurogenic changes. This concept of urologic disease is proper and more truly explains the development of pathologic changes. There are, in addition, short chapters on infertility, lesions of the external genitalia, catheterization, and history taking. An excellent list of reference books is appended. The author's concepts of the cause and treatment of pyelonephritis and chronic prostatitis merit the consideration of all physicians.

This volume is an outstanding contribution to medical literature. It is intended primarily for the medical student and nonurologist, but can and should find a place in the library of every specialist in genitourinary diseases. —J. W. SCHWARTZ, C. l. MC USA

DISABILITY EVALUATION Principles of Treatment of Compensable Injuries
by *Ea l D McB ide* M D 5th edition 715 pages 375 figure numbers
J B Lippincott Co Philadelphia Pa 1953 Price \$15

This is the fifth edition of a standard reference text and its purpose as before is to interpret the physiological and mechanical alterations arising out of injury to the motor structures of the human body and to reasonably appraise and evaluate the extent of functional loss as it relates to the economic incapacity of the injured

The author has found the need to review previous editions through his wide experience in teaching and writing on the subject of disability evaluation This edition contains many improvements The discussion of the causal relation of injury to disease is timely and of interest and importance to those faced with the necessity of expressing an opinion on such matters Although not lengthy this section is well referenced The rating schedules have been improved and enlarged

This text is considered a necessary part of the reference shelves of orthopedists and industrial surgeons It is of value to all medical officers of the armed services who are concerned with clinical and physical evaluation boards —A B DICKSON Lt Comd MC USN

PLANNING GUIDE FOR RADIOLOGIC INSTALLATIONS by the *Committee on Planning of Radiologic Installations of the Commission on Public Relations of the American College of Radiology* Wendell G Scott M D Chairman 336 pages illustrated The Year Book Publishers Inc Chicago Ill 1953 Price \$8

This committee report covers such important topics as design and arrangement of rooms ventilation and air-conditioning dark room planning film identification radiation protection and design of isotope and radium laboratories Each subject is discussed by a known authority in the field No attempt is made to reproduce typical floor plans but the basic principles of space and patient flow are thoroughly outlined so that departments of any size can be planned with ease

The illustrations are adequate and clearly captioned to complement the well written text Nearly one third of the book is devoted to the reproduction of three National Bureau of Standards Handbooks (No 41 Medical X ray Protection Up to Two Million Volts No 50 X ray Protection Design and No 54 Protection Against Radiation From Radium Cobalt-60 and Cesium 137) The first two are available from the Government Printing Office and the latter is a final draft of a handbook which will be released in late 1954

This book will be of importance to those physicians who are concerned with the construction or remodeling of radiology departments in clinics and hospitals —E M DeYOUNG Col MC USA

RENAL FUNCTION Transactions of the Fourth Conference October 22-23
 d 24 1952 New York N Y edited by Stanley E Baily M D
 189 pages illustrated Sponsored by the Josiah Macy Jr Foundation
 New York N Y 1953

This volume is a record of the transactions of the fourth of a series of five annual conferences on renal function sponsored by the Josiah Macy Jr Foundation in an attempt to stimulate research and promote effective communication across the departmental walls which tend to isolate the professions and specialties from one another. The conference program is designed to further knowledge in a particular field in renal function and to this end the participants were brought together to exchange ideas, experiences, data, and methods. Scientific investigators in all phases of renal function were represented. In the group were physiologists, anatomists, biochemists, internists, pediatricians, pathologists, and others. The booklet attempts to preserve the informality of the conference discussions.

For the average clinician this book is not recommended because discussions are highly technical and difficult to follow clearly. To the scientist doing research work in renal function, however, this report should be invaluable. Complete references are given at the conclusion of each of the four phases of renal function, thus the reader has ample opportunity to study more thoroughly the points brought out during the conference discussions.

—Col R T Artman MC USA

DIABETIC CARE IN PICTURES Simplified Statement with Illustrations
 Prepared by the U of the Pacific by H I R and I B S
 Joseph R and I M D 2d ed 164 pages 128 illustrations
 (1953) (1953) J B Lippincott Co Philadelphia P
 1953 Price \$3

This second edition of a book designed for use by the diabetic patient incorporates the latest concepts of the control of diabetes. Its purpose is to present a simplified explanation of diabetes and its treatment and to dispel the fears of the patient. The author makes full use of visual aids in explaining the planning of the diet and the administration of insulin. The illustrations follow directly after the written description, the caption under each illustration being taken verbatim from the text.

One major inclusion is a discussion of neutral protamine Hagedorn insulin, including a simplified description of its action and an explanation of when it should be used. Dietary exchanges, including charts and illustrations, are fully covered. The visual presentation of how to prepare and administer insulin and test the urine will prevent misinterpretation of instructions by the patient. Insulin reactions, acidosis, care of skin injuries, skin infections, personal hygiene, and care of hands and feet, including Buerger Allen exercises, are explained in language and with pictures that the uneducated patient can understand.

This is the type of book that every diabetic patient should read and keep for ready reference. Such a simplified version might be boring to the physician but, if he examines it with the idea that it is primarily for the use of the patient, he will discover that it will save him invaluable time in explanations that are essential for ideal control of the diabetic patient. There is no bibliography, but the index is adequate.

—E P McLARNEY *Capt. MC USN*

PROGRESS IN NEUROLOGY AND PSYCHIATRY. An Annual Review. Vol VIII edited by *E A Spiegel M D*. 591 pages. Grune & Stratton Inc. New York N Y 1953. Price \$10.

This review endeavors to encompass in a single volume the yearly literary output in psychiatry, neurology, the basic sciences of neuroanatomy, neurophysiology, neuropathology, and neurosurgery. The title appears inaccurate because most of the material covered does not truly represent progress in the respective fields, but is rather an effort to acquaint the reader with current reports of basic research and clinical investigation pertinent to psychiatry and neurology.

In general the book succeeds admirably in fulfilling the function for which it was intended. Its 36 chapters are each written by authoritative clinical or research workers. The editor has incorporated these contributions in a coherent presentation of the current status of the particular area under consideration. Several contributors make the common error of attempting to cover many published reports without a critical evaluation of the content or proper integration for the average reader. Each chapter contains an excellent bibliography that should prove invaluable for interested clinicians and research workers.

The volume is highly recommended to the busy practitioner of psychiatry or neurology who finds it difficult to maintain contact with the current literature in his special sphere. It is especially valuable for the psychiatrist who needs constant awareness of progress in neurophysiology and neuroendocrinology in order to balance a purely psychologic concept of behavior.

—Col A J Glass *MC, USA*

PICTORIAL INTRODUCTION TO NEUROLOGICAL SURGERY by *G F Rowbotham and D P Hammersley*. 108 pages illustrated. The Williams & Wilkins Co. Baltimore Md. 1953. Price \$4.50.

This short but interesting volume was elaborated by a British neurological surgeon and an artist in a pictorial attempt to acquaint surgeons in outlying communities with procedures designed to care adequately for cerebral trauma. It covers the essentials of positioning, flap designs, methods of hemostasis, and instruments and their usages. There are excellent drawings on handling

small cortical excisions and even on simple methods of plastic repair of scalp defects. Débridement of wound tracts, elevation of depressed fractures and repair of torn sinuses are also demonstrated. The authors adhere closely to the facts, omitting superfluous material and the artist has done an excellent job once the book gets beyond positioning and flaps where special efforts are unnecessary.

While it may be an accepted practice in England for general surgeons to attempt surgical treatments of rhinorrheas and otorrheas and to excise cortical scars, the reviewer believes this is an ill advised activity in this country where such procedures are usually the province of the neurological surgeon. Nevertheless, the book is a concise and handy volume which should be of considerable value to the general surgeon in any community where a neurological surgeon is not available.

—R W CARRITY *Cpt MC USA*

A PRIMER OF CARDIOLOGY by Gorg E B ch M D 2d d t on 339
 P g w h 214 ill trat L & F b g Ph l d lph P 1953
 P \$5.50

This short volume consisting of five chapters and an appendix is an introduction to cardiology. The first and last chapters on anatomy and arrhythmias respectively are adequate although each consists of only 30 pages. The second chapter presents the signs of organic heart disease and concepts of heart failure and edema. The third and fourth chapters cover auscultation of the heart in detail and summarize the principal types of heart disease giving short notes on their treatment. The appendix contains useful tables and diet lists.

Questionable sections include the listing of the following as dependable signs of organic heart disease: (1) generalized senile arteriosclerosis, (2) hyperthyroidism of several months duration, (3) myxedema, and (4) severe anemia of several weeks duration. It is misleading to state that infections are the commonest cause of heart disease and that the diagnosis may depend solely on changes in the electrocardiogram.

The best feature of the book is its thorough discussion of auscultation and its correlation in diagrams of heart sounds and murmurs with the other phenomena of the cardiac cycle. The New York Heart Association's Nomenclature and Criteria is used but it is to be regretted that the changes in the latest edition (1953) have not been incorporated. The section on congenital heart disease is excellent. This book is recommended as an excellent introduction to the auscultation of the heart but not as a text on cardiology. —Col R P Johnson *MC USA*

SHOCK AND CIRCULATOR HOMEOSTASIS Transactions of the Second Conference October 19 20 and 21 1952 edited by *Harold D Green*
M D 275 pages illustrated Josiah Macy Jr Foundation New York
N Y 1953 Price \$3 75

This publication presents the point of view of researchers each of whom is an authority in the metabolic aspects of hemorrhagic and traumatic shock and in the distribution and possible physiologic function of epinephrine and nor epinephrine

Animal experimentation is utilized in the search for the causes of irreversibility of the shock state to determine which is "cause" and which is "effect" Two factors of recent prominence assume dominate proportions in relation to the progressive shock states: *i e*, the role of clostridial infection in the liver subsequent to hypotensive states, and the production of vaso excitator material and vaso depressor materials No factual decision or conclusions are expressed but the arguments put forth are provocative of further investigation One significant element to be borne in mind is that all of the investigations have been carried out in the laboratory animal, and their application to the human being subjected to equivalent hypotensive states is still to be proved The nature of the publication makes it difficult reading but it is a work of distinct interest to the researcher in this important field of medicine For a book of its type it is well presented the graphs and tables are plentiful and clearly illustrate particular points The bibliography is extensive and the index is adequate in the field of experimental shock

—*Capt E H Dickinson MC, USA*

ANATOMY AND SURGERY OF HERNIA by *Leo H Zimmerman M D* and *Barry J Anson Ph D (Med Sc)* 374 pages illustrated The Williams & Wilkins Co Baltimore Md 1953 Price \$10

In this book a surgeon and an anatomist have collaborated to develop adequately their belief that "the treatment of hernia is early surgical repair," and that "no operation in surgery more rigidly demands the exercise of the utmost surgical finesse and technic than does the repair of hernia"

This monograph presents all the types of hernias in the abdominal cavity including diaphragmatic, internal, and pelvic forms and is complete in every aspect It begins with the development of the history of the subject, followed by a general discussion of the etiologic physiologic and pathologic factors The anatomic and embryologic presentation is particularly well done, and is profusely illustrated with detailed drawings of the normal and abnormal anatomy Accompanied by serial diagrams, the clinical aspects and the pathologic anatomy of each type of hernia is presented separately with a step-by step description of

MEDICAL TREATMENT OF DISEASE by *Henry A. Chittenden, A. M., M. D.*
 LL. D. Sc. D. (Hon.) M. A. C. P. H. F. R. C. P. (Can.) D. S. M.
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 P. c. \$25

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 of. th. Army. W. shngto. D. C. 80 p. g. ll. rat. d. Ch. l. C. Th. m.
 Publ. her. Sp. g. f. ld. Ill. 1954 P. c. \$2.75

PSYCHOLOGICAL FACTORS IN THE CARE OF PATIENTS WITH MULTIPLE SCLEROSIS for U. f. Phys. cia. by *M. R. H. r. u.* Ph. D. nd.
 Ro. l. d. H. rm. B. A. P. ep. r. d. f. th. Nat. l. M. l. t. pl. Scl. ro.
 S. ty. 270 P. k. A. e. ue. N. w. Y. ok. 17. N. Y. 32 pag. ll. u. t. at. d.
 N. t. n. l. M. l. t. pl. Scl. s. Soc. ety. New. York. N. Y. 1953. Grat.

THE CUTANEOUS MANIFESTATIONS OF SYSTEMIC DISEASES by *Joh. G. d. D. u. ing.* M. D. P. f. f. D. r. m. t. l. gy. nd. Syph. l. l. gy.
 Tuft. Coll. g. M. d. c. l. Sch. ol. P. of. s. f. D. r. m. t. l. gy. Ro. t. Un.
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MONTHLY MESSAGE

Rear Admiral Lamont Pugh, in his article, "Doctors for the Armed Forces," reprinted on page 553 in this issue of the *Journal* ably reviews the factors governing the average young doctor's rejection of a military medical career, and the failures and successes attending various plans designed to modify these factors. Last month's issue of the *Journal* contained a reference to the Womble report, and the text of a letter from Dr John A Hannah pointing out that at present there are more inducements to leave the armed services than there are to remain. Apart from any financial reasons let us consider two major factors militating against a worthwhile career for a doctor in the armed services—the geographic instability of military life, and the arbitrary limitations which military requirements impose on the choice and development of a medical career.

Unfortunately, because the size of the regular Medical Corps is comparatively small, it has become increasingly difficult to assure its members of the permanent assignments so vastly important to their families, the education of their children, and their professional establishment. Moves, sometimes as frequent

as after four months duty at a station have a disintegrating effect on a medical officer's morale

Most physicians and surgeons in civilian life look forward to establishing themselves in community practice or to an academic industrial or administrative position. Like all who desire to form ties with their chosen home the surgeon wants to become known in and identified with his community large or small the internist looks forward to an eventual career as a consultant and the specialist takes pride in the referrals which build his reputation. All become interested in their county or state medical organizations and various national professional associations. Those in the academic world anticipate becoming well known in research or teaching and many combine teaching with practice.

Although attempts are constantly being made to increase the attraction of a medical career in the armed services they will not succeed until the medical officer is given the opportunity to establish his identity in his chosen work and to test his skills and his relations with others in a reasonably permanent career situation. As he attains senior grade he should be allowed to develop a teaching research administrative or specialty career in his chosen field on the basis of long term tenure at a given station. In this way the best officers in the profession will emerge to gain their rewards they will be sought after by junior officers and by prospective applicants for commission in the three services. This is not only possible within the framework of our existing laws but necessary if the services are to attract and hold men of stature.

This is a long range program and will be difficult to accomplish. A pay scale moderately comparable to that existing in civil life should be instituted by Congress and adequate housing or allowances provided to foster the dignity of the officer and his family. The first and simplest step might be the reintroduction of the 30-year retirement privilege. This is an incentive for men to remain in service after reaching early maturity thus contributing their knowledge and experience. It is a stimulus to the sustained and purposeful effort necessary in building a reputation among both civilian and military members of the medical profession. Allowing retirement after 20 years with a moderate pension also keeps the services relatively young and provides for more rapid advancement.

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OSSEOUS LESIONS SECONDARY TO INFECTED MISSILE WOUNDS

Observations in Treatment With Antibiotics

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WOUNDS sustained as the result of warfare must be considered infected from the onset. The dynamic forces established by the penetration of the body by a missile produce considerable destruction of tissue which will undergo necrosis and liquefaction, and be discharged from the wound. The rate of this process depends on the nature of the tissue involved, being more rapid for muscle than for fascia, and delayed when bone is involved. This necrosis provides a favorable medium for the growth of any organisms present. Although the heat of the explosion or that generated by transmission of the missile may make it a relatively clean object, the offending missile of itself may be incompatible with living tissue and may establish an unfavorable reaction. The missile may carry foreign material, including pathogenic organisms, into the depths of the tissue and thus establish an infected wound. The wound may also become infected by subsequent contact with soil or other infected material.

The initial treatment of such wounds is early thorough débridement. The wound is exposed, explored, all foreign material and devitalized tissue surgically removed, and copiously irrigated with saline. The wound is then dressed open to await further treatment, the nature of which depends upon the success of the initial débridement. An open wound is an infected wound, at least it is not bacteriologically sterile, although it may generally be considered clinically clean. The former condition is determined by cultural methods, and the latter by clinical inspection. Because an open wound is considered an infected wound, the clinical evaluation must determine the degree of local or general infection.

A locally infected wound without devitalized and necrotic tissue may be considered surgically clean, and closed secondarily.

by excision of the infected surface and approximation of the skin edges or covered with a skin graft. Wounds with necrotic tissue must be treated further to remove such tissue before closure. If the infection is regional or general, the infection must be eradicated and the wound made clinically clean before closure is attempted.

A large number of techniques have been devised in an attempt to combat wound infections. These include simple incision and drainage, the Carrel-Dakin technic, local application of antiseptic agents, use of maggots, urea, intravenous injection of dyes, sulfonamides, and antibiotics. War wounds involving the bone and producing a secondary osteitis form a group which have shown the greatest resistance to therapy, and it is this group with which we are particularly concerned.

During the treatment of more than 500 patients with osteitis secondary to war wounds, we have observed that results were dependent on the completeness of the saucerization and the vigor and intensity with which antibiotic therapy was used. We have further observed that a number of organisms which varied in their sensitivity to the various antibiotics were present. Control of the infection depended on adequate concentrations of the antibiotic with the infected area, assisted by liberal excision of scar tissue and sclerotic bone during the course of the saucerization and the local instillation or irrigation with appropriate antibiotics to supplement the parenteral dosage. In cases where organisms were reported resistant to an antibiotic to which that species was normally sensitive, suppuration often increased when the antibiotic was discontinued, but when the dosage of the antibiotic was increased, this suppuration decreased or ceased.

It has been reported that when organisms *in vivo* become resistant to antibiotics they tend to remain resistant, whereas artificially induced resistance *in vitro* experiments may often be reversed. North and Christie have demonstrated also that the resistance of virulent *Micrococcus pyogenes* var. *aureus* to penicillin *in vivo* did not decrease, but *in vitro* it did decrease. Segalove found that the resistance of various strains of *M. pyogenes* var. *aureus* to penicillin was highly variable. He believed that resistance to penicillin was probably due to the formation of penicillinase in some cases, and the selection of naturally resistant cells in others. Spinl and Ferris found that four strains of *M. pyogenes* var. *aureus* which were made resistant to penicillin *in vitro* produced penicillinase and did not regain their sensitivity. Four other strains made resistant to penicillin *in vitro* did not produce penicillinase and regained their sensitivity.

Because our clinical impressions appeared to be at variance with the laboratory experiments of others, a study of a group of cases of chronic osteomyelitis was undertaken in an attempt to clarify this difference.

A series of 21 consecutive patients with chronically infected bone lesions secondary to war wounds were studied with serial bacteriologic examinations. The tibia was involved in 13 of these patients, the femur in two, the ulna in two, and the humerus, scapula, os calcis, and the acetabulum in one each.

Under aseptic conditions, cultures were made at weekly intervals and sensitivity tests were done. When the identity and sensitivity of the organisms were determined, the appropriate antibiotics were administered and surgical procedures were performed.

The natural defense mechanisms and reparative powers of the body must not be underestimated. Nothing should be done to interfere with these efforts, but the treatment should be directed toward assisting nature to eradicate infection and heal wounds. This was accomplished by surgical excision and wide saucerization of the infected area, and of all cicatricial barriers which reduced circulation to the site. Twice a day, 300,000 units of penicillin and 0.5 gram of streptomycin and every six hours, 250 mg of terramycin and aureomycin were given until healing was complete. Chloramphenicol was abandoned as a routine agent because of its toxicity. Fifty milligrams of polymyxin was administered twice a day to two patients but discontinued within 24 hours because of paresthesias about the mouth and tongue, and pain at the sight of injection. Trypsin proved to be a valuable adjunct to antibiotic therapy in patients with deep wounds and sinus tracts as well as in superficial suppurative wounds. Where soft tissue defects existed adequate skin coverage was provided and a high protein, high-carbohydrate diet with vitamin supplement was given. Sympathectomy proved a valuable adjunct in wounds with poor skin coverage.

Cultures from a single wound may yield one or many different organisms. On culture only three wounds produced a single organism, which in each instance was hemolytic *Staphylococcus pyogenes* var. *aureus*. Multiple organisms were cultured from each of the other 18 wounds. Hemolytic *Staphylococcus pyogenes* var. *aureus* present in 17 of the wounds was the most prevalent organism. *Pseudomonas aeruginosa* was cultured from eight wounds, *Micrococcus pyogenes* var. *albus* from seven, *Escherichia coli* from six, proteus species from five, *Aerobacter aerogenes* from four, paracolon bacillus and *Streptococcus faecalis* from two and *Clostridium perfringens* from one (table 1).

TABLE I

P	S d	f	Org isms	I d	I l b				y	R na k	R l
					P	T	Aur	Chl			
1	Spl		H ly M pyog ne ur us M pyog ne r albus		+	R	R	+	R	P S P R Aur R Aur S N h e	God
2	Tb		P us r P er g nos Str fae l		R	R	R		R	N ha e N ha e V h e	God
3	Tb		H m lyt M pyog ne ur us A ae e ne P er g no P l b llus		R +	R	R +	+	R	N h e P S P R R S R Str S N h e B m S Aur Chl dT	God
4	Tb		H m lyt M pyog ne ur us		R			+	R	Chl S Chl R Chl S b m T S T R T S	F
5	Tb		E l P us r		R	R	R		R	N h e N h e	p or

TABLE 1 —Continued

Patient	Site of disease	Organisms isolated	Intolerance					Remarks	Results
			Pe	Ter	Aur	Chl	Str		
5 (control)	Tibia	<i>Ps aeruginosa</i>	R	R	R	R	R	No change	
		<i>Cl perfringens</i>	++	++	R	R	R	No change	
6	Femur	Hemolytic <i>M. pyogenes</i> variety <i>aureus</i>	R	R	R	++	R	Pe and Ter R to Pe and Ter S reversed to R	
		<i>M. pyogenes</i> variety <i>albus</i>	R	++	R	++	R	N change	Good
		<i>E. coli</i>	R	R	R	++	++	Ter and Aur R to S Str S to R to S	
		<i>P. tuspecis</i>	R	R	R	++	++	Chl and Str S to R to S	
		<i>Ps aeruginosa</i>	R	R	R	R	R	No change	
7	Tibia	Hemolytic <i>M. pyogenes</i> variety <i>aureus</i>	R	R	R	++	R	Chl Str Aur R to S to R b t Tr S	
		<i>M. pyogenes</i> variety <i>albus</i>	++	++	++	++	++	No change	Good
		<i>Paracolon bacillus</i>	R	R	+	R	R	Aur Str R Tr R to S to R then Str to S	

S = Sensitive
R = ResistantPe = Penicillin
Tr = TerramycinAur = Aureomycin
Chl = Chloramphenicol

Str = Streptomycin

+ = Mildly sensitive
++ = Sensitive

TABLE I—C t d

P t	S f d	Org ms l d	I al b				y		R ma ks	R l
			P	T	Aur	Chl	S			
8	T bus	H m ly M pyog ne ur us l pyog ne l bus E l P erogeno	+			+	R	P S R Str R		
			R	++			R	N ha s		G od
			R			+		N hang		
			R		R			B m R II		
9	T b	H m lyt M pyog ne va aur us Gal/kyat t ag na	R		++		+	N ha s		
			-	-	-	-	-	R p d ly N por d		G d
10 d II	R gh d l f t b	H m lyt M pyog ne va ur us E l P us pe P aer g no St fae l	R	R	R		R	B m R		F
			R		R		R	B me R		
			R	R	R		R	N hang		
			R	R	R		R	B cam R		
			R	R	R	R	R	N ha s		
			-	-	-	-	-	R por d ly N p d		P or
12	U l	M pyog va l bus E l	R	R	R	R	++	N h s		

TABLE 1 —Continued

P t i nt	Site f d a	Organ sms is l ted	I ntial nt bi tic				t ty		Rema ks	R lts
			P n	T r	Aur	Chl	Str			
13	O s c l e s	H m lyt c M pyogen s var aureus	R	++	++	++	R	N cha g	Good	
14	T b a	Hemolyt c M pyog n s ar aureus M pyog nes v r lbus	R R	R R	R R	++ R	R R	Chl St R Pen T r d Aur R to S B m R t Chl St Pe Ter a d Aur	Good	
15	Tibia	Hemolyt c M pyogenes var aureus E coli A aerogenes Diphther id bacilli	R R R -	R ++ ++ -	R ++ ++ -	R ++ ++ -	R R R -	No chang No chang N change Rep rt d only once No ensitiv tes repo t d	Fair	
16	Femur	H m lyt c M pyog nes var aureus A aerogenes Ps aerogenosa D phthe d bacilli	+ R R -	R ++ R -	R + R -	++ ++ R -	R R R -	P n and Chl St R Te nd Aur R to S N change Became S to Chl Repo ted once with ut sen ti tie	Good	
S = Sensiti e R = R ista t			P n = Penic llin T r = Terr mycin		Aur = Aureomycin Chl = Chloramph n col		Str = Str pt mycin		+ = Mildly ensiti e ++ = S n itive	

TABLE 1 —Continued

P t	S f	Orga n s l l d	I t l b i l i y					R m a k s	R i
			P	T	Aur	Chl	S r		
17	H m e u s	H m l y t M p y o g n e u s M p y o g n e l b u s S t p l o c o c u p y o g n e P u s p e c	R ++ R R	++ ++ R ++	++ ++ R R	++ R ++ R	R R R ++	P R S l l b S t R T d A u r S t R R p r e d l y n e N h a g	G o d
18	A t a b l m	H m l y t M p y o g n e u s A a e r g n e	+ R	R +	R R	+ ++	R R	P S t R A u r R t S N h a g	F u r
19	U l n a	H m l y t M p y o g n e v a a u s	R	++		++	++	N h a g	P o r
20	T b	H m l y t M p y o g n e v a u s M p y g l b u s P a e r o g n o s	R R R	R R R	R R R	R ++ ++	R R R	N h a g N h a g C h l S t R S t R t S	P o r
21	T b	H m l y t M p y o g n e a u s	+	R	R	R	+	N h a g	F u r
S S a s t R R	P T	P T P T P T	A u r A u r A u r	C h l C h l C h l	S t r S t r S t r	S t r S t r S t r	P m y P m y P m y	+ M i d l y S i	

Of the 52 organisms isolated, 31 consistently showed no changes in sensitivity, during the period of observation 21 organisms demonstrated changes in sensitivity (table 1). Some organisms initially reported as being sensitive to a certain antibiotic were later reported as being resistant to that antibiotic but sensitive to another. Some organisms which were first reported resistant were later reported sensitive to the same antibiotic. In the majority of these cases, even though the laboratory studies indicated that the organism had become resistant, the patients continued to improve clinically. When an organism became resistant to an antibiotic, the dosage of that antibiotic was doubled because the resistance was considered to be relative and as long as clinical response was observed, continued administration of the antibiotic was justified.

It would appear that the sensitivity of an organism to an antibiotic agent is not constant and may be lost, particularly with small doses of the antibiotic. When resistance develops toward one antibiotic, the organism may develop a sensitivity to another to which it has previously been resistant. Some organisms, which initially had been sensitive and had subsequently become resistant, later regained sensitivity with continued employment of an antibiotic (table 1).

The alteration in sensitivities caused speculation concerning the responsible mechanisms. Contamination of the wound with new organisms of the same species could account for these observations. In spite of all precautions cross contamination is almost impossible to rule out. Patients in this series were observed at different times and were from widely separated sources. Cultures were taken from patients with osteomyelitis under conditions as aseptic as possible, and cross contamination was believed at a minimum. The liberation of organisms from pockets within the wound was also a possible source of organisms of the same species with different susceptibility to the antibiotic tested.

It has long been recognized that environment causes many forms of life to be altered. Hence it can be theorized that such a phenomenon might be a factor in the altered susceptibility of organisms to antibiotics.

It was again demonstrated in the treatment of chronic osteomyelitis that persistence and patience are required for satisfactory results. Our results in the treatment of 21 patients with this condition were classified as good, fair, or poor. The result was considered good if drainage ceased completely and the wound remained healed four weeks after surgical treatment, fair if drainage ceased from four to eight weeks after operation, and poor if

the drainage continued more than eight weeks following surgical treatment. The following results were observed: Good 11, fair six, and poor four.

A hemolytic *M. pyogenes* var *aureus* resistant to all antibiotics and *M. pyogenes* var *albus* resistant to all antibiotics except chloramphenicol were cultured from one wound showing poor results. Another wound with poor results contained *E. coli* sensitive to aureomycin, chloramphenicol, and terramycin. Proteus species and *Ps. aerogenosa* resistant to all antibiotics and *Cl. perfringens* sensitive to penicillin and terramycin. All 21 wounds were healed at the end of 12 weeks.

SUMMARY AND CONCLUSIONS

Seldom is a single causative organism cultured from an infected wound. In our experience *M. pyogenes* var *aureus* is most consistently isolated from war wounds and was present in 81 percent of the patients treated.

Organisms in wounds under therapy initially sensitive may become resistant to antibiotics. Some organisms in vivo resistant to an antibiotic may lose their resistance under certain circumstances. Although sensitive organisms in wounds become resistant to certain antibiotics, a clinical response may be observed following increased dosage with that antibiotic.

Proper surgical procedure is the major consideration in the treatment and control of infected war wounds. Adequate doses of antibiotics were a valuable adjunct in the control of osteomyelitis secondary to war wounds when preceded by adequate surgical treatment and assisted in the prevention of secondary infection.

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STARCH SPONGE AS A HEMOSTATIC AGENT IN ORAL SURGERY

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SINCE the time, nearly a decade ago, of the development of the cornstarch sponge,¹ this material has been advocated as an absorbable hemostatic agent and as a substitute for talc in glove lubrication.

The purpose of this report is to review the previous work with the starch sponge and from this information and other tests to point out a technic for the clinical use of starch as a hemostatic agent in various oral surgical procedures. In addition, an attempt is made to answer certain questions regarding the effect of certain mouth conditions on the starch sponge and to draw some comparisons between starch and the other absorbable sponge materials used in oral surgery.

STARCH AS SUBSTITUTE FOR TALC

Much of the original work with this material was concentrated on investigation of a chemically modified starch powder as a substitute for talc in lubrication of surgical rubber gloves. When starch was used for this purpose, its physical properties were shown² to compare favorably with those of talc. Because of the possibility of wound contamination with powder it was suggested that the absorbable starch might cause fewer adhesions and granulomatous responses than the nonabsorbable talc.

The importance of this problem has been pointed out by Weed and Groves,³ who found that 22.6 percent of the rubber gloves during operations became perforated. A voluminous amount of literature by Owen,⁴ Gardner,⁵ and others has been written describing the hazards and sequelae of wound contamination with talc.

MacQuiddy and Tollman⁶ experimented extensively with starch in this regard and found it more absorbable and less irritating to peritoneal cavities of experimental animals than talc. Further

the drainage continued more than eight weeks following surgical treatment. The following results were observed: Good 11, fair six, and poor four.

A hemolytic *M. pyogenes* var. *aureus* resistant to all antibiotics and *M. pyogenes* var. *albus* resistant to all antibiotics except chloramphenicol were cultured from one wound showing poor results. Another wound with poor results contained *E. coli* sensitive to aureomycin, chloramphenicol, and terramycin, proteus species, and *Ps. aerogenosa* resistant to all antibiotics, and *Cl. perfringens* sensitive to penicillin and terramycin. All 21 wounds were healed at the end of 12 weeks.

SUMMARY AND CONCLUSIONS

Seldom is a single causative organism cultured from an infected wound. In our experience *M. pyogenes* var. *aureus* is most consistently isolated from war wounds and was present in 81 percent of the patients treated.

Organisms in wounds under therapy initially sensitive may become resistant to antibiotics. Some organisms in vivo resistant to an antibiotic may lose their resistance under certain circumstances. Although sensitive organisms in wounds become resistant to certain antibiotics, a clinical response may be observed following increased dosage with that antibiotic.

Proper surgical procedure is the major consideration in the treatment and control of infected war wounds. Adequate doses of antibiotics were a valuable adjunct in the control of osteomyelitis secondary to war wounds when preceded by adequate surgical treatment and assisted in the prevention of secondary infection.

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TECHNIC OF USE

The starch sponges about 1 by 1 by 2 cm, were sterilized in a small, widemouthed, screw topped jar. Sterilized starch sponge maintains a somewhat rigid but spongy consistency on storage and may be used in its dry form, or after it has been moistened. But moistening which was done by spraying sterile normal saline solution on the sponge with a syringe, was found to have a beneficial effect on the working properties of the sponge. Too much water causes the sponge to become soft doughy, and too slippery for easy handling.



Figure 1 The starch sponge with instruments and materials used in its application (1) wrapped starch sponge bar (2) starch sponge bar (3) starch sponge cut to proper size (4) sterile water (5) jar for autoclaving and disinfecting and (6) gauze sponge

Instruments and materials recommended for inclusion on the surgical tray are a Luer syringe, bottle of sterile normal saline solution, scissors and spring forceps (fig. 1). The operator cuts the sponge to the proper size and shape and inserts it in the wound. Suturing is facilitated by placement of starch sponge because bleeding can usually be controlled by absorption of the blood into the interstices of the sponge.

EVALUATION OF EXPERIMENTS

For purposes of evaluation the patients were divided into two categories: 37 patients with presumably normal bleeding time

(table 1) in whom a starch sponge was employed so that its behavior could be studied and compared with carefully selected controls in the same mouths (table 2) and six patients with abnormal bleeding tendencies in whom starch sponge was used either to prevent or to control hemorrhage

TABLE 1 Postoperative bleeding tendency in starch treated

Procedure			Complication		
Method	Type	Number	Postoperative bleeding	Postoperative pain	Outcome
Experimental (starch)	Tooth (omplid)	71	0	2	1
	Tooth tract (urgil)	3	0	0	0
	Alveoloplasty	2	0	0	0
	Total	76	0	2	1
	Percent		0	2.7	1.4

Average bleeding time 14 min

The patients in the former group were selected on the basis of their availability for postoperative observation. Their need for additional operations provided adequate controls within the same mouth. The operations included uncomplicated exodontia, tooth extractions, and alveoloplasties. Controls used were identical or nearly identical surgical procedures on the opposite side of the same dental arch in the patient from the starch treated wound. The operative problems and the anatomy of teeth and investing tissues on either side were relatively similar. For example, upper molars were compared only with upper molars, lower incisors with lower incisors of the opposite side, and so forth. Some patients had only one experimental and one control extraction, while others had several of each. In comparison of alveoloplasties, one side of a treated ridge was compared with the other. Whenever possible, control and experimental operations were performed at the same sitting. The only cases reported are those in which satisfactory controls were available in the same patient. The control site was treated by a standard procedure which usually consisted of holding a plain gauze sponge on the operative site for 30 minutes by biting pressure. The treatment

of the wound in the experimental cases differed only in that a quantity of starch sponge was placed in the tooth socket before closure and placement of the gauze pack

TABLE 2 *Postoperative observations in control wounds*

Procedure			Complications		
Method	Type	Number	Post-operative bleeding	Post-operative pain	Osteitis
Control	Tooth extraction (uncomplicated)	78	3	3	2
	Tooth extraction (surgical)	3	0	1	0
	Alveoloplasty	2	0	0	0
	Total	83	3	4	2
	Percent		3.6	4.8	2.4

A g e b l d g t m 2 0 m i

A record for each patient was kept, indicating the identity of the teeth or areas operated on, whether experimental or control, the duration of active bleeding, and the incidence of common postoperative complications

Bleeding time was determined by removal and replacement of the plain gauze sponge at one-minute intervals until escape of blood from the margins of the socket ceased. The bleeding time in 76 experimental procedures with the starch sponge averaged one and four tenths minutes, with a range of from one to four minutes. Bleeding time in 83 control procedures in the same patients averaged two minutes with a range of from one to six minutes. Not a single starch treated wound showed longer bleeding time when compared with its individual control.

Abnormal postoperative bleeding occurred in three of the 83 control procedures but in none of the 76 starch treated wounds.

Postoperative pain occurred in two patients treated with the starch sponge and in four patients in whom the control procedure was used. Osteitis followed the treatment of one wound with a starch sponge and two control wounds with standard sponge. This is about the average incidence of this complication at this clinic.

In many cases the starch containing wound was less inflamed and better healed than the control when seen from two to four days postoperatively. However the healing sockets in unsutured wounds treated with starch sponges though not inflamed appeared deeper than in the controls four to six days postoperatively. Whatever the cause of this phenomenon the eventual healing occurred in periods of time equal to that of the controls. No foreign body type reaction was apparent in any of the patients.

VALUE IN HEMORRHAGE CONTROL

The effectiveness of starch sponge in prevention or treatment in six patients with abnormal hemorrhage was studied. Two patients had moderately severe hemorrhage postoperatively from tooth extractions 24 and 48 hours respectively. Bleeding appeared to come from the osseous socket and pressure alone did not control it. A starch sponge was packed tightly into each socket over which the tissue was sutured and the patient was given a gauze sponge to bite on. No further bleeding was noted.

A third patient required removal of seven maxillary teeth and a deeply impacted upper cuspid. During the course of the operation severe bleeding was encountered from vessels along the uncovered palatine portion of the maxillary bone. Pressure failed to control this bleeding but a starch sponge used in a method similar to that suggested by Rosenfeld² did. One end of a starch sponge is immersed in warm normal saline solution and is wiped across the bleeding site. This method is particularly suitable in areas where roughened bone is exposed. The wet starch fills the spaces between the bony irregularities combining with the blood to form a gelatinous material and effecting rapid hemostasis.

In another patient with an established diagnosis of thrombocytopenia and a bleeding time of four minutes a starch sponge was used in conjunction with thrombin after the extraction of three posterior teeth at two sittings. Immediately after each extraction the socket was packed with a starch sponge which had been dipped in freshly prepared thrombin solution. The postoperative course was uneventful.

Two patients gave histories of previous bleeding episodes following exodontia but no specific cause for such bleeding was evident. As a precaution a starch sponge with thrombin was used in each patient with normal postoperative course.

SUMMARY AND CONCLUSIONS

Starch sponge is an absorbable hemostatic agent which is apparently well tolerated by the body including alveolar bone. The low cost of its manufacture may be of importance in con-

sideration for its further development. Saliva did not hinder its hemostatic action nor did the reaction between starch and saliva produce enough acid to inhibit the action of thrombin solutions.

In relatively uncomplicated exodontia surgical tooth extractions, and alveoloplasties, starch sponges were convenient to use and did not significantly affect the incidence of postoperative complications, the rate of healing, and bleeding time. In patients with abnormal bleeding of primary and secondary types starch sponge was effective in controlling hemorrhage.

The use of starch sponge is not considered a substitute for ordinary precautionary measures for the detection of hemorrhagic disease, nor should it take the place of sound surgical principles which, in the presence of normal coagulation processes, will nearly always prevent undue bleeding.

It is believed that starch sponge merits further investigation as a hemostatic agent. This has been in the nature of a preliminary study so far as oral surgery is concerned and its continuance will be directed more toward treatment of patients presenting abnormally profuse or prolonged bleeding where the field of practical application for substances of this type more truly exists.

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New Institute of Pathology



This is the art st s drawing of the new home of the Armed Forces Institute of Pathology which is rapidly nearing completion on the ground of the Walter Re d Army Medical Center in Wa hi gto D C. The buildi g will b ready for occup ncy by 1 August 1954 according to pres nt plans

COLLAGEN TAMPONS AND MEMBRANES USED EXPERIMENTALLY IN DOGS

CARL A. BROADDUS Jr. *Lieutenant MC USN*

PHILIP N. SAWYER *Lieutenant MC USNR*

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A communication indicating that collagen tampons and membranes were being used in Europe as hemostatic and dural replacement agents and that reports in the European literature of experimental and clinical trials were essentially favorable, prompted this study in dogs to evaluate the potentialities of such materials.

These products* used were produced under aseptic conditions from the tendons of cows and horses. The isolated fiber has a diameter of about 75 microns, and the membranes are formed by combining fibers to give a thickness of 0.04 to 0.06 mm. The weight of the tampon is about 2.5 to 3 mg/cc.

The project chosen for investigation of the materials, was outlined as follows:

Phase 1 Hemostasis, employing collagen tampons in dogs, with controls (gelfoam, plain gauze, and no treatment).

Phase 2 Dural replacement employing collagen membrane in dogs, with controls (fibrin film and no replacement).

Phase 3 Subcutaneous implantation of collagen for evaluation of reaction and absorption, with controls (fibrin film and no treatment).

Further proposed studies including sterility control, antigenicity mechanism of hemostasis, and finally, clinical evaluation in the human were deferred until completion of the first three phases.

* From National Naval Medical Center, Bethesda, Md. Lt. Broadbush, now at P. S. 111, Morrell Hospital, Chapel Hill.
* Produced in Germany and placed in the Ziegler-Bellin Germany.

METHODS

Phase 1 It was attempted (by applying collagen tampons, gel foam, and plain gauze to similar bleeding situations in dogs) to determine the efficacy of collagen as a hemostatic agent.

TABLE 1 Splenic bleeding

Agent	Number of determinations	Mean bleeding time
Collagen	20	75 sec
Gelfoam	20	24 sec
Untreated	10	10 sec

15- by 15- by 0.5-cm plugs excised. Digital pressure over hemostatic gauze with 1-lb. pressure. Every 10 sec.

TABLE 2 Splenic bleeding

Agent	Number of determinations	Mean bleeding time
Collagen	10	200 sec
Gelfoam	10	80 sec
Gauze	10	325 sec
Untreated	8	400 sec

Incisions in edge of spleen 1.5 cm deep. Hemostatic gauze placed on pressure.

TABLE 3 Splenic bleeding

Agent	Number of determinations	Mean bleeding time
Collagen	10	60 sec
Gelfoam	10	10 sec
Untreated	5	0 sec

Wedges 3 by 0.5 cm. from edge. Digital pressure over hemostatic gauze with least disturbance on 10-sec. interval.

Each animal was anesthetized by injecting nembutal sodium (pentobarbital sodium) intravenously; the abdomen shaved, prepared with tincture of mercuriolate, and draped. A left transrectus incision was made. In the first two animals, the spleen was delivered into the wound and experiments on the control of splenic bleeding performed, with the results indicated in tables 1 to 4. Four standard types of splenic wounds were produced. The results were

- a Abrasions of surface produced by a fine toothed hemostat
 b Excision of 1.5 by 1.5 cm square of capsule
 c Wedge resection
 d Sharp incision, 1 cm long and 1 cm deep

TABLE 4 Subcutaneous small vessel bleeding with digital pressure maintained

Agent	Number of observations	Time for hemostasis
Collagen	3	4+ minutes
Gelfoam	3	30 seconds
Gauze	2	4+ minutes

TABLE 5 Bleeding from small vessels in ectus abdominis

Agent	Number of observations	Time for hemostasis
Collagen	3	6+ minutes (unabated so gelfoam substituted arresting bleeding in 90 seconds)
Gelfoam	3	90 seconds

TABLE 6 Bleeding from deep circumflex iliac and inferior mesenteric arteries

Agent	Number of observations	Time for hemostasis
Collagen	2	No effect
Gelfoam	1	3.5 minutes

In the third dog (tables 4 to 6) control of arterial bleeding was studied. Both the deep iliac circumflex and the inferior mesenteric arteries were transected at a point 1 cm distal to the aorta. The test substance was simply placed over the bleeding vessel, with minimal digital pressure. For study of small vessel bleeding transverse sharp 2 cm incisions were carried down through the skin, subcutaneous tissue, anterior rectus sheath, and 5 mm of the underlying muscle. The larger arteries and veins were ligated and the test substance placed in the wound.

Phases 2 and 3 These were run on the same animals. Anesthesia and nature of preparation were as discussed above. A right temporal craniotomy was performed under aseptic conditions with electrocoagulation for control of bleeding. A 1.5 by 2.0 cm section of dura was then excised and a slightly larger piece of moist collagen membrane tucked smoothly into the defect with its periphery beneath the dural edge. The bone flap was replaced and the wound closed with cotton. A collodion dressing was applied. Identical procedures were employed in control animals with fibrin film being substituted for the collagen membrane in one group and no agent being used to close the defect in the second.

Omitting two dogs that died at operation, one from hemorrhage and the other from anesthesia, ten dogs underwent dural excision. In four, collagen membrane was used to close the defect; in three, fibrin film was used; and the other three were controls.

In four of these dogs, transverse 3 cm incisions were made to the right of the spine in the mid back, the incisions being made about 5 cm apart.

The subcutaneous areolar tissue was bluntly dissected with a single swipe of a flexed index finger. Hemostasis was effected with No. 80 cotton ligatures. A 2 by 2 cm piece of collagen membrane was placed in the anterior wound, a similar piece of fibrin film in the middle wound, and nothing in the posterior wound. Each wound was closed with No. 50 cotton and collodion was applied.

RESULTS

Phase 1 The results are shown in tables 1 through 6. The controls were satisfactory; i. e., the untreated areas all had essentially the same bleeding times, far longer than the treated areas. It is seen in tables 1, 2, and 3 that collagen is much less effective against bleeding splenic wounds than is gelfoam. On splenic abrasions, gelfoam, collagen, and plain gauze are all effective. Collagen is slippery and difficult to handle with no tendency to adhere, swell, or produce tamponade.

For small vessel or arterial bleeding (tables 4, 5, and 6), collagen seems completely ineffectual.

Phase 2 The results are included in table 7, where it is seen that fibroblastic and inflammatory responses were maximal for collagen and minimal for fibrin. In the two dogs in which collagen membrane was used and that were autopsied after 20 days, the collagen had been completely replaced, but there was a fibroblastic and inflammatory mass uniting the brain with the replaced bone flap. This was also noted in the one dog with no dural substitute that was posted at 21 days. The one dog in which fibrin film was employed and that was allowed to live beyond 20 days

TABLE 7 Duration of placement

Dogs	Recipient animal	Infiltration of brain	Subarachnoid fibroblastic activity	Subarachnoid inflammatory response	Change of graft	Fibroblastic activity of graft	Inflammatory response of graft	Gliosis	Clinical description and findings
1	Collagen	0	4+	3+	fragmented	3+	4+	1-2+	Comatose sacrificed 7th day purulent meningitis
2	Collagen	2	3	3	early dissolution	3	3	2	Sacrificed 8th day adhesions between brain and skull
3	Collagen	2	3	3	granular	3	3	1	Sacrificed 23d day adherent mass between brain and skull
4	Collagen	1	3	3	granular	3	3	1	Sacrificed 29th day adherent mass between brain and skull
5	Fibrin	0	1	1	unchanged	1	1	1	Sacrificed 8th day no adhesions
6	Fibrin	0	1	1	early dissolution	2	0	0	Sacrificed 22d day no adhesions
7	Fibrin	Dead							
8	None	0	0	0				0	Died after 1 day herniated brain

TABLE 7 Dural plate removal—Continued

Dx	Rpl m g	Iflw f br	S b h d f b o bl y	S b h d fl mm o ry p	C d f gr f	F b o bl y d gr f	I fl mm ory p d gr f	Gl o bl	Cl l ur nd f d g
9	N	0	2	3				2	S f d 10 h d y loc l m g
10	N	1	2	2				1	S f d 21 d y dh m betw b d k ll

(posted at 22 days) still had a relatively intact piece of fibrin in the dural defect, and there was no attachment of brain to skull or even of brain to fibrin

Fibrin caused little reaction and was very slowly replaced. Collagen evoked marked reaction and was replaced in about 20 days. The reaction persisted and united the bone flap and brain with scar tissue. The scar tissue formation in the dogs in which no replacement agent was used paralleled that noted in the dogs in which collagen membrane was used. One dog in which no agent was used died of cerebral herniation through the dural defect. This occurred in none of the dogs in which fibrin or collagen was employed. It was noted that collagen membrane, when moistened prior to insertion, was convenient to work with, resembling dura in consistency and flexibility. Fibrin film was slippery and less pliable.

TABLE 8 *Subcutaneous implantation*

Dog	Agent employed	Replacement of graft	Fibroblastic reaction	Inflammatory cell reaction
1	Collagen	3/4	4+	4+
2	Collagen	Traces remain	4	4
5	Collagen	Almost complete	4	4
10	Collagen	Complete	4	4
1	Fibrin	None	0	0
2	Fibrin	None	3	3
5	Fibrin	None	1	1
10	Fibrin	Slight	0	0
1	Nothing		0	0
2	Nothing		3	3
5	Nothing		2	1
10	Nothing		0	0

Phase 3 The results of subcutaneous implantation are shown in table 8. At the time the dogs were autopsied, wedges were excised to include the areas of collagen, fibrin, and control wounds. All wounds were clinically free from infection and hemorrhage. Results were expressed as objective evaluation of microscopic sections (firs 1 and 2) stained with hematoxylin and eosin.



Fig 1 S b ta t t ub ch f b f l m u p l d g h t d y p
ly Th a m m l f b r b l a s t c a d f l a m m t y p s n d t b
f m f l m l t l y s t

Collagen caused marked inflammatory and fibroblastic response in the surrounding tissues. It was replaced in 20 days but the reaction persisted. Fibrin evoked no more response than that ob-



Fig 2 S b c t a n e s t t h h l l g m m b n e a p l d g h t
d y p r l y Th s e f l a m m t o r y a d f b b l t p a n d
the l l a g m e m b r n e f g m e t d n d l m o t c m p l t l y a b o r b d

erved with the same amount of dissection when no material was used in the wound. The fibrin showed only slight absorption in 30 days.

CONCLUSIONS

Collagen tampons were compared with gelfoam and ordinary gauze as a hemostatic agent for venous and arterial bleeding. It was found that collagen was inferior in adhesive qualities, would not expand to offer effective tamponade, and was inferior even when these failings were corrected by the exertion of steady pressure. It was approximately one fifth to one third as effective against splenic bleeding or ooze as gelfoam, and showed no tendency to arrest major arterial or small vessel bleeding.

Collagen membrane (unlike collagen tampon in hemostatic tests) was easy to use, resembling the normal dura. It does not seem acceptable for dural substitution however because of its rapid resorption (20 days) and the marked inflammatory and fibrous tissue response which it evokes. After resorption of the collagen, there is a scar uniting the brain and overlying bone. This is indistinguishable from the scar noted after 20 days when no dural agent is employed and the dural defect is merely left open.

Collagen after subcutaneous implantation was completely digested in 20 days. There was, again, associated inflammatory and fibroblastic reaction.

It is recognized that the number of animals used in each phase of this experiment is small. Because of uniformly unfavorable results obtained however it is believed that further experimental and clinical evaluation of this material is not indicated.

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Caudal Anesthesia

The resident house staff of St. Louis Maternity Hospital conducted 5,000 continuous caudal anesthetics over a seven-year period. In 81.5 percent of the patients the results were entirely satisfactory. Partial success was obtained in 5 percent. Failures occurred in 13.5 percent.

—ALBERT GOLDHAR M.D. and
WILLIAM H. MASTERS M.D.

in *Mississippi Valley Medical Journal* p. 124. Sept. 1953.

VENTILATION AND OXYGEN ABSORPTION IN THYROIDISM

An Analysis of Respiratory Tracings

JAMES C SYNER *C pt n, MC USA*

THE respiratory tracing from which the basal metabolic rate is determined is seldom if ever inspected or analyzed by physicians. If these tracings were inspected they would be of great value in obtaining information on pulmonary ventilation in thyroid dysfunction as well as in evaluating the state of the patient during the metabolism test. Apprehension, anxiety, and discomfort will appear as a grossly irregular tidal exchange producing a variable oxygen uptake, sighing respirations, and a variation in the respiratory rate. The calculation of the tidal volume, respiratory rate, and minute volume will provide information of ventilatory activity relative to oxygen consumption.

In an analysis of 75 random basal metabolism tests at this hospital, these were inspected for evidence of air leaks in the system, stigmas of pulmonary dysfunction, and appraisal of the patient's state (steady, variable, apprehensive, relaxed, etcetera). In addition to oxygen consumption, the tidal exchange, respiratory rate, minute volume, and ventilation equivalent of oxygen were determined. The procedure in calculating these values has been adequately covered in other sources.¹⁻³ Briefly, the ventilation equivalent of oxygen expresses the efficiency of oxygen absorption relative to the volume of pulmonary ventilation, and indicates that for every 100 cc of oxygen absorbed, x liters of gas were ventilated.

The ventilation equivalent of oxygen is important in the detection and study of factors involved in hyperventilation. Hyperventilation is a physiologic alteration present in many disease states. A variety of factors are involved in its production. It occurs in pulmonary disease with associated ventilatory dysfunction, distribution/diffusion impairment, lowered arterial oxygen tension, and altered pulmonary reflex mechanisms in fibrosis. It is present in cardiovascular/pulmonary disease in which there is impairment in pulmonary blood flow, and in states of fear, anxiety, and pain. It has also been reported in hyper

¹F m W I R d Amy H p t a l W h g D C

thyroidism * a finding not substantiated by this study or by Puppel and Wrobel * Conventionally, hyperventilation is regarded as being present when a rapid respiratory rate is combined with an apparently shallow movement. The increased pulmonary ventilation relative to oxygen absorption is usually not considered. Only by the direct measurement of ventilatory volume and oxygen absorption from the respired air is this relationship shown. The concept of hyperventilation is suggested as a state in which a large amount of air is ventilated with the associated low oxygen absorption expressed quantitatively as a high ventilation equivalent of oxygen. A patient with a respiratory rate of 25 per minute and tidal exchange of 450 cc (minute volume, 11.3 liters per minute) may appear to be hyperventilating. With an oxygen uptake of 380 cc per minute, however, a high normal ventilation equivalent of oxygen (2.96) is obtained. Therefore, in meeting a particular oxygen need the patient is not hyperventilating. A patient with a comparable minute volume and oxygen consumption of 250 cc per minute has a ventilation equivalent of oxygen of 4.5 which is a considerable elevation above the normal. In meeting that particular oxygen need the patient is hyperventilating.

TABLE 1 Ventilation equivalent of oxygen for various conditions

Condition	Number of patients	Number of observations	Mean ventilation equivalents of oxygen	Extremes ventilation equivalents of oxygen
Hyperthyroidism	8	20	1.95	1.7-2.14
Hypothyroidism	6	14	5.85	3.89-13.1
Chronic anxiety	4	12	3.44	2.35-6.12
Normal	57	71	2.46	2.23-2.75

In this study a significant difference in the pulmonary ventilation equivalent of oxygen was noted between the hyperthyroid and hypothyroid patients (table 1). Patients with hyperthyroidism absorbed a much larger quantity of oxygen from a given amount of respired oxygen than did normal patients. This is expressed quantitatively in the low mean ventilation equivalent of oxygen (1.95). Patients with hypothyroidism absorbed a much smaller quantity of oxygen from a given amount of respired oxygen than did the normal patients. This is expressed quantitatively in the high mean ventilation equivalent of oxygen (5.85). This mean was influenced by one patient (case 3, table 2) with hypothyroid-

TABLE 2 C m l t f t h t l t q a l t o f y g w t h t h t u d v m t a b l i c t i e s

C e	B m b o l	O y g o u m p t (p r m)	M t v l u m (l t p r m)	V l t e q l t (o y g)	M B C (l t p r m)	I 131 (p r k)	Chol (mg per 100)	C l i a l d g o
1	17	280	53	19	110	67	177	H y p e r t h y r i d i m
	29	295	50	17	112	67	159	
2	14	395	845	214	122	76	179	H y p e r t h y r o d i m
	43	370	77	208	118	76	163	
	-5	250	852	341	O e m t h f t r 400 mg p p y l h o u r l d i l y			
3	+2	250	227	90	140	10	395	H y p t h y r d m
	10	223	303	131	136	10	389	
4	18	240	125	52	145	16	266	H y p o t h y r o d i m
	-22	236	132	56	142	16	255	
5	14	295	111	376	155	35	198	C h o c t e
	43	379	127	335	151	35	204	

M m l b e h a g p y

ism secondary to pituitary chromophobe adenoma and associated increased intracranial pressure. The degree of extreme hyper ventilation (minute volume, 22.7 to 30.3) which was due to the increased intracranial pressure is speculative because follow up studies were not available. There is usually slow, stertorous breathing, however, in patients with increased intracranial pressure.¹⁰

This study suggests that oxygen absorption is so efficient in uncomplicated hyperthyroidism that such patients can hypoventilate and still meet the increased demands of the hyper metabolic state. In contrast, the patient with hypothyroidism may need to hyperventilate to meet the oxygen needs of a less demanding state. The data in table 2 suggest that the ventilation equivalent of oxygen often correlates better with the metabolic state than does the calculated basal metabolic rate. This calculation can be of value in the interpretation of the measured basal metabolic rate. When correlated with clinical data and associated laboratory results, it provides the clinician with a further diagnostic tool for appraising the validity of the measured basal metabolic rate as reflecting a state of thyroid dysfunction or extrathyroid influences. In respect to this latter problem, the value of careful inspection of the character of the respiratory tracing cannot be overemphasized.

Weymouth and Brice,⁸ from an analysis of basal metabolism records, concluded that in both hypothyroidism and hyperthyroidism there was overventilation with a fall in the volume of oxygen absorbed per tidal breath. They expressed this as the coefficient of ventilation (CV) and defined it as the volume percent removed as oxygen from the tidal volume. Their observations agree with this study on hypothyroidism but not on hyperthyroidism.

Puppel and Wrobel reported an increased efficiency of absorption of respired oxygen by patients with hyperthyroidism. They found that patients with hyperthyroidism absorbed a much larger quantity of oxygen from a given amount of respired oxygen than did normal people. They found that patients with extrathyroid causes of hypermetabolism had a near normal coefficient of absorption. In their experience adequate medical or surgical therapy returned the absorption to normal. These findings agree with the data reported in this paper. Puppel and Wrobel made no mention of studies on hypothyroid patients.

In concluding, that overventilation was characteristic of both hypo- and hyperthyroid states. Weymouth and Brice postulated that both an excess and a deficiency of the thyroid secretion increased the sensitivity of the respiratory center. That either the absence or the presence of a given stimulus may produce the

same effect does not seem reasonable. If it is logical to assume that excess thyroid substance stimulates the respiratory center to produce a characteristic ventilatory response then its absence should result in a contrasting ventilatory pattern. Contrasting ventilatory patterns should be found in these different disease states.

In concluding that hypoventilation with increased efficiency of absorption of respired oxygen was characteristic of hyperthyroidism Puppel and Wrobel postulated that a great increase in minute volume of blood flow through the lung was largely responsible. My own findings as well as those of Puppel and Wrobel that increased efficiency of oxygen absorption in hyperthyroidism and decreased efficiency of oxygen absorption in hypothyroidism are consistent with such a mechanism. Actually there are two fundamental ways by which a greater demand of the tissues for oxygen may be met: (1) by increasing the total blood flow through the tissue and (2) by increasing the coefficient of oxygen absorption by establishing a steep oxygen pressure gradient between the arterial blood and alveolar sac on the one hand and the venous blood on the other. The extent to which each operates is both variable and speculative.

SUMMARY

In calculating the ventilation equivalent of oxygen from the respiratory tracing of a basal metabolic test, a further diagnostic tool may be obtained for appraising the validity of the basal metabolic rate as reflecting a state of thyroid dysfunction or extrathyroid influences. In this study a significant difference in this value was noted between patients with hyperthyroidism and those with hypothyroidism. The former absorbed a much larger quantity of oxygen from a given amount of respired oxygen than did normal persons. The patients with hypothyroidism absorbed a much smaller quantity of oxygen from a given amount of respired oxygen than did normal patients.

Inspection of the respiratory tracing will aid in evaluating the state of the patient during the procedure. Calculation of tidal volume, respiratory rate and minute volume will provide information of ventilatory activity which can serve as a means of detecting conditions of pulmonary insufficiency. Because of the rather wide variability in the ventilation equivalent of oxygen this pattern may fail to show in some individual observations.

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Surgery as an Applied Science

In a sense the whole history of surgery over the past few centuries has been one of transition from empirical to scientific approaches. Pare as early as the sixteenth century made good use of current advances in anatomy. But the transition accelerated with progress in fields related to surgery and constantly enhanced the prestige of surgeons themselves. Thus John Hunter who is said to have made English surgeons over into gentlemen was a great anatomist and anthropologist as well as an outstanding surgeon and each of his interests benefited from the others. Again Dupuytren the celebrated surgeon of the *Hôtel Dieu* in Paris (1777-1835) emphasized the importance of pathologic anatomy as a basis for surgery. In the later nineteenth century it became of the greatest value for the surgeon to know physiology as well as anatomy. Physiology opened new possibilities to surgery and the men who exploited these attained fame as pioneers. One need recall in this country only such instances as are afforded by Halsted's work on the care of tissues, Cushing's on endocrinology and brain surgery and Crile's on surgical shock. Today all able surgeons are workers in applied science and some conduct basic research as well.

—RICHARD H SHRYOCK, Ph.D.
in *Journal of the International College of
Surgeons* p 513 Oct 1953

same effect does not seem reasonable. If it is logical to assume that excess thyroid substance stimulates the respiratory center to produce a characteristic ventilatory response then its absence should result in a contrasting ventilatory pattern. Contrasting ventilatory patterns should be found in these different disease states.

In concluding that hypoventilation with increased efficiency of absorption of respired oxygen was characteristic of hyperthyroidism Puppel and Wrobel postulated that a great increase in minute volume of blood flow through the lung was largely responsible. My own findings as well as those of Puppel and Wrobel that increased efficiency of oxygen absorption in hyperthyroidism and decreased efficiency of oxygen absorption in hypothyroidism are consistent with such a mechanism. Actually there are two fundamental ways by which a greater demand of the tissues for oxygen may be met: (1) by increasing the total blood flow through the tissue and (2) by increasing the coefficient of oxygen absorption by establishing a steep oxygen pressure gradient between the arterial blood and alveolar sac on the one hand and the venous blood on the other. The extent to which each operates is both variable and speculative.

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condition. The presence of metastases, which sometimes will be discovered before the primary site, of course determine the cancerous state.

CLINICAL CONSIDERATIONS

Nevocarcinoma is to be considered in the differential diagnosis of all pigmented tumors of the skin, and uncommonly will present itself nonpigmented. Only infrequently will there be any difficulty for the experienced clinician in correctly identifying verruca vulgaris and seborrheic warts, the smooth sessile fibroma durum, the soft, friable, and readily hemorrhagic pyogenic granuloma, the soft elastic, and often vermiform hemangioma, the abruptly bordered and usually crusted basal cell epithelioma, and the usually multiple, firm, and nodular Kaposi's sarcoma.

The knowledge of the areas of predilection of the various tumors is as helpful to the clinician as is the recognition of dyskeratotic phenomena to the histopathologist. When it comes to pigmented nevi, however, the examiner treads on unfirm ground. Generally it can be said that the common pigmented "mole" of the layman, is an elevated, uniformly tan to dark brown, uneven and soft nodule, frequently hairy. Several to many are present in the same individual and the numbers are prone to increase at puberty. This is the nevus histologically denominated as the cellular, intradermic type, and is invariably benign. However, the junction type nevus and nevocarcinoma can simulate this clinical picture. Conversely, when the intradermic nevus develops folliculitis and becomes exuberant with an inflammatory pyodermic response, it is easily mistaken for nevocarcinoma.

This situation has led some histopathologists to decry the reliability of clinical diagnosis in general, but they should remember that most of them are not experienced clinicians, and that an occasional error by the latter does not negate their whole science. In this respect a critical appraisal of histopathologic diagnosis reveals many weaknesses. Among them, the accurate differentiation of some senile keratoses from prickle cell epithelioma, of simple fibroma durum from fibrosarcoma, and of junction nevus from nevocarcinoma. Considering that the histopathologist deals with dead tissue distorted by fixatives, and must depend on the size, shape and staining reaction of cells composing it, it would be surprising if he had no difficulty in relating his findings to living tissue.

The junction type nevus, on the average, is flat and macular, uniformly tan to irregularly black in color, palpably indistinguishable from the surrounding skin and hairless. It differs histo-

logically from the intradermic variety by revealing the characteristic epidermo dermal proliferation of melanogenocytes also called dendritic or clear cells. At puberty junction nevi frequently enlarge and elevate irregularly increase their pigmentation and if first seen then may be mistaken for the intradermic type. Such a change is physiologic far more often than it is malignant. Other junction nevi however said by the patient to have been unchanged throughout life apparently are of the clinical intradermic type from the beginning. The giant nevi often having a bathing trunk distribution or involving the junction of an extremity with the trunk are verrucous, irregularly pigmented and may contain nodules and hair. They are a clinical variant of the junction type and are prone to malignancy.

The blue nevus of Jadassohn Tschhe is the third of the cellular types. Clinically it has a blue or slate gray color because it is situated in the mid or lower corium the overlying normal skin filtering out part of the color just as it does with veins. Because of its position it is macular or only slightly nodular. It is usually solitary but the Mongolian spot which is histologically identical may be multiple as are related lesions found infrequently on the cheeks. Most authorities label this a benign growth though there are sparse and questionable reports of malignant blue nevus. Traub and Keil³ quoting the supporting opinions of others stated that they have never seen a malignant growth develop from such a lesion.

Considering the foregoing clinical pitfalls the best practice is to take a specimen for biopsy from questionable lesions. There is a hesitancy on the part of many physicians to employ this procedure fearing extension of an already malignant process or transformation to malignancy. Becker observed, however, that biopsy actually interferes with possible spread the subsequent inflammatory reaction sealing the local lymphatic channels for a short period and Sachs and associates stated that they have never seen malignant transformation follow biopsy, nor increase the degree of existing malignancy.

HISTOLOGIC CONSIDERATIONS

It has been stated above that there were no invariably reliable histologic findings for the diagnosis of nevocarcinoma and at the same time histologic examination was recommended for questionable lesions. These statements are reconciled by the fact that the histologic structure will differ sharply in the pigmented lesions which arise from cellular nevi and in those which do not. The benign intradermic and blue nevi can thus be distinguished from the junctional type and the inflamed pyodermic intradermic nevus from nevocarcinoma but when it comes to the

question of junction nevus versus nevocarcinoma, the pathologist also treads on unfirm ground. Many of them will disagree with this statement, clinging to histologic criteria of malignancy which have proved to be reliable in other cancerous conditions, but which clinical evidence repeatedly indicates are of questionable application to nevocarcinoma. Thus Allen and Spitz⁶ stated, "In those restive junctional nevi, in which anaplastic and certain qualitative cellular changes have occurred, the odds are enormous that this *altered* junctional nevus, if allowed to remain, in time would evolve into a melanocarcinoma." In contrast, Lund and Stobbe⁷ stated, "junctional proliferation in nevi of adults does not in itself indicate melanoblastoma." Wise⁸ in a discussion of Traub and Keil¹ stated, "In many instances of this type the clinical diagnosis seems to have more weight than the microscopic." It is the inferential application of histologic data to clinical course which is greatly responsible for the existing confusion concerning the diagnosis and treatment of nevocarcinoma.

Consideration of juvenile melanoma emphasizes the impossibility of unequivocal distinction between junction nevus and nevocarcinoma. Named because it was thought originally to occur only before the age of puberty, juvenile melanoma occupied a special niche, being histologically indistinguishable from adult nevocarcinoma and yet having *clinical* behavior that was very rarely malignant. Spitz's⁹ study of this entity delineated a special cytologic feature of some benign lesions, namely, the presence of a large mononuclear or multinucleated cell having an acidophilic cytoplasm, sometimes granular but seldom containing pigment. This cell was "argentophobic," and while myxomatous in appearance was not of muscle origin tinctorially.

While most tumors of this type were in children below the age of 12, Spitz found one in a 19 year old, and Allen and Spitz⁶ reported one in a patient of 42. Spitz found other tumors in children, however, that were histologically undifferentiated from adult nevocarcinoma, not of this special cell type, and which also behaved in a benign manner. They were composed of cells irregularly enlarged with vesicular nuclei which were sometimes duplicated, and were without prickles, even when situated in the epidermis. Often islands of these large pigmented cells extended down into the dermis and were accompanied by a constant but variable degree of inflammatory reaction and edema. Mitotic figures usually could be found without difficulty. Depending upon what the author is consulted, some or all of these findings of variation in the individual cells: multiplication of nuclei, loss of prickles, invasion of the cutis, inflammatory response to that invasion, and the presence of mitotic figures, will be considered

as evidence of malignancy. Yet to repeat lesions so characterized behave in a benign manner in children. Recalling that the juvenile melanoma of Spitz's specific cell type is now known to be benign even in adults does it not seem more than likely that other as yet unclassified cell types may persist into adult life and also behave benignly? Allen and Spitz answer this in their discussion of juvenile melanoma. They included both pre and post-pubertal lesions under this title applying it to any lesion in which *clinical* benignity controverts the *histologic* malignancy. Although among the leading proponents of the histologic diagnosis of nevocarcinoma they were able on histologic grounds alone to determine benignity in only two thirds of the cases. To state this in another way one out of every three patients demonstrated clinically to have had a benign lesion, on histologic grounds alone could have become a candidate for radical surgery. Consider with what greater frequency this must have happened where the *histopathologist* failed to accord to the clinical evidence the weight it deserves. Masson who has spent a lifetime studying nevi and nevocarcinoma says of the relation ship between them. We should possess some very accurate and safe histologic criteria for malignancy we have none at present.

A method has now become available however which gives great promise of solving the problem. Lerner and associates¹¹ demonstrated the presence of tyrosinase in human skin and at least experimentally determined that it and not Bloch's dopa oxidase was responsible for the conversion of tyrosine into melanin. Fitzpatrick¹² employing first the histochemical method of detecting tyrosinase and later the biochemical method of oxygen uptake showed that unirradiated normal skin was negative for tyrosinase activity as was the intradermic cellular nevus. The junction nevus was negative to weakly positive, but nevocarcinoma both pigmented and unpigmented was strongly positive. Other conditions such as prickle cell epithelioma, pigmented basal cell epithelioma, verruca senilis, lentigo and ophelides all failed to give the tyrosinase reaction. If such a pattern continues to be elicited then indeed will nevocarcinoma be invariably distinguished.

TREATMENT

Treatment is no less controversial than the establishment of the diagnosis. Inability to establish an unquestioned diagnosis has invalidated many statistics and the confusion is compounded by an apparently variable and unpredictable degree of malignancy in this tumor. Undoubtedly tumors of low malignancy have been cured by conpulation when mistakenly treated as pigmented nevi while others are never cured regardless of the measures used.

Allen and Spitz's⁶ well documented study reveals that of 123 patients surviving five years or longer, 84 received only local excision. The remaining 39 had additional node dissection. Of these, 14 had local recurrences yet survived re excision five years or longer. A low degree of malignancy may have accounted for this large number of survivals. The high end of the scale is ably presented in Pack and associates'¹¹ oft quoted study, 552 of their 862 patients had recurrent lesions, having received prior treatment elsewhere. Their best results were obtained by wide and deep excision of the primary lesion (at least 6 to 10 cm. of skin border, and a still wider circle of deep fascia), of the lymphatic drainage of the primary site (that is, a strip of skin between it and the regional nodes), and of the first group of regional nodes, all of this en masse. Where the primary site was at a great distance from the nodes, as in hand or foot, radical amputation was performed. Despite this determined attack, their results were far less favorable than in Allen and Spitz's series noted above, being 17.7 percent five year survival for localized melanoma (Pack's term), and 15.6 percent for metastatic melanoma. That this extreme procedure did not give a preponderance of cures probably resulted from the fact that only the lymphatic route of metastasis thereby was interrupted. The vascular route often is utilized by nevocarcinoma, and this may be the explanation of an apparent degree of malignancy. Cure or death may depend on the chance erosion of the tumor into a blood vessel, because once it enters the circulation it has escaped beyond the scope of present day therapeutic measures.

The conservative philosophy of the treatment of primary nevocarcinoma considers the ever-present possibility of an error in diagnosis, the chance that vascular metastases are hidden internally, and weighed against these, the permissible degree of disability ensuing from treatment. The radical philosophy disregards the question of diagnosis, shifting this responsibility to others, shrugs off the possibility of vascular metastases as therapeutically insoluble and aims its major effort at lymphatic metastases. No degree of ensuing disability is considered limiting, the basic premise being that the saving of a life justifies critical sacrifices of tissue. When all facets of the problem receive equal weight it is apparent that some degree of calculated risk must accompany any form of treatment. An attack based only on local excision of the primary site does no great harm to the patient, even if the diagnosis has been wrong, it does not disable for the remainder of life should vascular metastasis have preceded treatment and it conserves comparatively large amounts of tissue including whole extremities, at the risk of not encompassing lymphatic metastasis. Its total risk therefore is far less than that of the radical so-called "prophylactic" procedures.

There are indications that the solution of the problem of nevocarcinoma may be gained through chemotherapy. For years the halo nevus has been a dermatologic curiosity. It is so designated because of the halo of depigmentation surrounding the central nevus. Leider and Fisher, after long observation of such lesions pointed out that eventually the nevus entirely disappears not even leaving a histologic trace. The loss of the ability to produce pigment in some way destroys the nevus. Coupling this observation with the discovery that only nevocarcinoma possesses an active enzyme system for producing pigment it seems likely that an inhibitor of that enzyme might be a potent therapeutic agent perhaps able to attack the metastases as well as the primary lesion.

SUMMARY

Nevocarcinoma is the precise term for this rare disease. There are no invariably reliable histologic or clinical criteria for the establishment of this diagnosis. In view of the ever present possibility of an error in diagnosis and the chance that vascular metastases may have occurred treatment should be conservative.

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POTASSIUM IN THE TREATMENT OF CARDIAC ARRHYTHMIAS DUE TO DIGITALIS INTOXICATION

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CARDIAC arrhythmia during digitalis intoxication is potentially serious. In many cases the rhythm will spontaneously revert to normal after withdrawal of digitalis. In some patients, however, the arrhythmia may persist, especially in those in whom the more slowly excreted preparations such as digitalis leaf or digitoxin have been used. This causes an increased strain on an already diseased heart particularly if ventricular tachycardia develops. Active measures must be taken to obtain a normal sinus rhythm if myocardial exhaustion, increased congestive failure, and even death are to be prevented.

Administration of potassium salts has been reported to be effective in the rapid re-establishment of normal sinus rhythm in cases of arrhythmia due to digitalis intoxication¹⁻³. It apparently was a lifesaving factor in a patient treated at this hospital.

CASE REPORT

A 42 year old woman was admitted to this hospital on 22 December 1952 complaining of nausea, vomiting, and weakness. In the fall of 1950 she had noted the onset of progressive dyspnea, orthopnea and ankle edema; however, she did not seek medical attention until November 1951. Because of rheumatic heart disease manifested by mitral insufficiency and stenosis with increased pulmonary artery pressure, she was placed on a low sodium diet and given ammonium chloride, digitalis leaf (0.1 gram daily) and frequent injections of mercaptomerin sodium (thiomerin). On 20 December 1952, following an injection of 2 cc of mercaptomerin sodium, marked diuresis occurred for 24 hours and the patient developed a general feeling of increasing weakness, followed by nausea and vomiting, for which she was admitted to the hospital.

When first examined she was acutely ill lethargic and frequently vomited small amounts of clear green liquid. Her blood pressure was 112/65. Her pulse was regular with frequent premature contractions and the rate was 95 to 100 per minute. Her heart was moderately enlarged and a harsh grade III systolic murmur with a questionable diastolic component was heard best at the apex. The first mitral sound was loud and snapping and the second pulmonic sound increased in intensity.

TABLE 1

D	S m mEq/L		U p m		
	Sod m	P m	Il ur	mEq f d m	mEq f p m
22 D 1952	135	3.5	12	75	95
23 D 1952	140	5.3			
25 D 1952			24	40	27.5

Laboratory study findings revealed the following: blood urea nitrogen 17 mg per 100 cc; carbon dioxide combining power 26 mEq/L; blood chlorides 96 mEq/L. The urinalysis showed a one plus albumin. The sodium and potassium levels of the urine and blood serum are recorded in table 1. A roentgenogram of the chest showed generalized cardiac enlargement, especially of the left atrium and pulmonary artery segments and slight pulmonary congestion. An electrocardiogram on admission showed atrial tachycardia with a 1:1 atrioventricular block (fig 1A).

Because of the suspected diagnosis of low sodium syndrome and digitalis intoxication digitalis was withheld and after blood samples had been obtained for study, the patient was given 100 mg of pentobarbital sodium (nembutal) intramuscularly and 1,000 cc of 0.9 percent sodium chloride intravenously. The serum sodium level (table 1) failed to confirm the initial impression of sodium depletion. With treatment however the patient improved, vomiting stopped and she slept for several hours. The arrhythmia persisted at a slower rate until about eight hours after admission when bigeminal rhythm developed superimposed on the atrial tachycardia with a 1:1 A-V block (fig 1B). This was soon replaced by a nodal tachycardia followed by a return to atrial tachycardia with 1:1 A-V block and frequent multifocal extrasystoles (fig 1C). The patient began to vomit again and it was believed that ventricular tachycardia might develop if reversion to normal sinus rhythm was not accomplished.

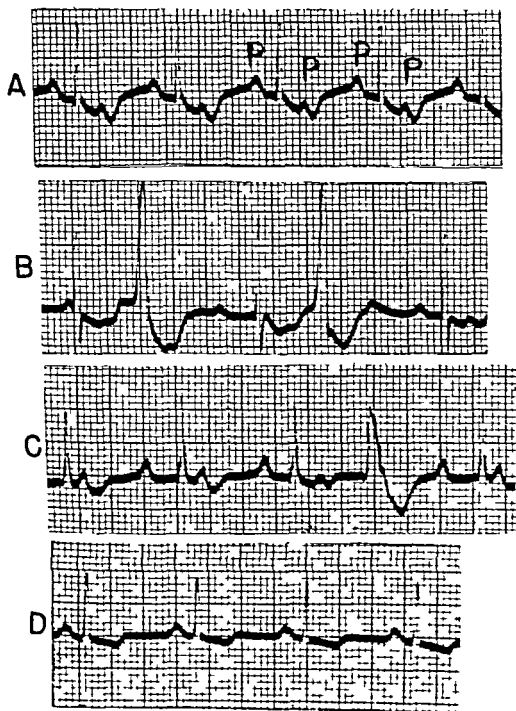


Figure 1 Electrocardiograms taken 23 December 1952 prior to and after treatment of patient with potassium. (A) Atrial tachycardia with a 2:1 atrioventricular block. (B) Normal rhythm superimposed on the atrial tachycardia with a 2:1 AV block. (C) Atrial tachycardia with a 2:1 AV block and an extrasystole. (D) Normal sinus rhythm 15 minutes after a second dose of potassium chloride.

The patient was given 0.9 gram of potassium chloride orally in enteric coated capsules. One hour later the dose was repeated.

Fifteen minutes after the second dose of potassium chloride the cardiac rhythm reverted to a normal sinus mechanism (fig 1D) During the next 10 days 0.3 gram of potassium chloride was given three times daily and normal sinus rhythm was maintained At the end of 10 days potassium chloride was discontinued because of gradually increasing dyspnea orthopnea and weight gain and the patient was redigitalized with digoxin Abnormal rhythm did not recur and the patient was discharged from the hospital

DISCUSSION

Lown and his associates have pointed out that a decrease in the intracellular potassium may result in increased sensitivity of the heart muscle to digitalis and that excessive loss of potassium during diuresis may result in digitalis intoxication in patients on a maintenance dose The administration of potassium chloride allows reversal of the process of cellular depletion thereby decreasing the digitalis effect Conversely Hopper reported a case in which the ECG changes due to hyperkalemia in a uremic patient were reversed by the administration of digitalis The exact mechanism by which potassium exerts its influence on the normal heart and its relationship to the action of digitalis is not clearly understood

It is possible that the benefit to our patient following the administration of potassium chloride was fortuitous Spontaneous reversion to normal sinus rhythm might have occurred without it but this seems unlikely for the following reasons (1) Development of other cardiac arrhythmias (nodal tachycardia multifocal extrasystoles and bigeminal rhythm) suggested increasing rather than decreasing digitalis effect (2) The patient was in negative potassium balance when admitted to the hospital (table 1) High urinary potassium in the presence of the relatively normal serum potassium implies cellular depletion of that cation to maintain the serum level (3) Clinical experience of others had been similar to ours Cohen included in his review the observations of several investigators who reported reversion to normal rhythm of various digitalis induced arrhythmias following the administration of potassium salts Of particular interest is the report by Lown and associates of six patients all on digitalis or one of the glycosides who experienced 14 episodes of atrial tachycardia with block following either an increase in the dose of digitalis or excessive diuresis induced by mercury The similarity between the electrocardiograms and clinical courses of those patients and of ours is striking The dose of potassium following which the rhythm returned to normal varied from 40 to 100 mEq of potassium ion and the time from 45 to 120 minutes In our patient the reversion occurred 75 minutes after the oral

administration of 24.4 mEq of potassium ion (18 grams of potassium chloride) Lown at the same time reported five patients with various arrhythmias not caused by digitalis intoxication. In these the administration of potassium was without effect despite induction of severe hyperkalemia in two of the patients.

These observations suggest that potassium salts are specific in the management of cardiac arrhythmias caused by digitalis intoxication, and may offer definite advantages over methods of therapy previously advocated with quinidine and procaine amide hydrochloride (pronestyl) which themselves have the propensity to cause cardiac arrhythmias. This danger apparently is not present when potassium is taken in the dosage prescribed. We believe that potassium chloride may be given safely, either orally or intravenously, to any patient with adequate renal function, and it is more reliable in bringing about a reversion to normal sinus rhythm than quinidine sulfate or procaine amide hydrochloride.

SUMMARY

Prompt reversion to normal sinus rhythm of a patient with atrial tachycardia with 2:1 A-V block caused by digitalis intoxication followed the oral administration of enteric coated capsules of potassium chloride. Although reversion will occur in many instances without specific treatment other than the withdrawal of digitalis, an occasional patient requires more active measures because of persistence of the arrhythmia.

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Never become too self-reliant to utter a silent prayer in time of stress. This source of strength makes a physician out of a doctor of medicine.

—JAMES S. KLUMPP, M.D.
in *West Virginia Medical Journal*
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THE PORTENT OF PULMONARY INFILTRATION OR FIBROSIS OF UNDETERMINED CAUSE

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SINCE February 1941 the Navy has required a roentgenogram of the chest as part of the physical examination to determine fitness for entry into active duty. In addition since 1944 such examinations have been required prior to release from active duty and when practicable at annual intervals while in the service. Frequently these roentgenograms reveal pulmonary defects suggestive of tuberculosis the cause of which often cannot be determined during hospitalization for clinical evaluation. The disposition of persons with such defects has posed a problem because the diagnosis of tuberculosis was in general incompatible with retention of the member on active duty.

The policy has now been adopted that persons with evidence of pulmonary tuberculosis considered to be of present clinical significance are not retained on active duty. Evidence of pulmonary tuberculosis of no present clinical significance particularly when discovered during the course of treatment for some intercurrent condition or during routine examination is not a cause for separation from the service. In a nonofficial publication emphasis was placed upon pathologic bacteriologic and roentgenographic confirmation of the diagnosis of tuberculosis.¹

In order to provide a classification for patients with lesions represented only by unchanging roentgenographic shadows the following diagnostic titles were added to the nomenclature: infiltration pulmonary cause undetermined; fibrosis pulmonary cause undetermined; and calcification pulmonary cause undetermined. It was also directed that persons with roentgenographic findings which may be of future clinical significance shall have a roentgenographic examination of the chest every six months when possible using 14 by 17 inch film.

A case review of tuberculosis in the Navy during 1949 revealed that the records of 12 percent of patients with active or

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TABLE 1 S mm ry f th e p e i f m g p / 117 i d e d t y 1949 p e d f m th r v 1950 1952

D g mbe f p e v d to d ty 1949	D g f p e p / 117 i d e d t y 1949 p e d f m th r v 1950-1952					T tal
	f l m r y e b i					
	A e m ul	A t m d r a d d	A t d m l	A t d m d v a d d	A t y	
T b ul p l m o n a y m m l (16)		1				1
I f l r a t d t m n d (51)	3	2	1		1	7
C l f e t p l m o d e r m e d (22)						
F b r o i l m o n a y u n d t m n d (28)		4		1		5
T l	3	7	1	1	1	13

graphic examination Five remained on duty for 30 months or more before their final admission, one patient had acid fast bacilli in the sputum and bacteriologic confirmation was obtained for two more

TABLE 2 Incidence and total incidence rate by age group of patients returned to duty 1949

Diagnoses	Age group			
	Under 25 years	25-34 years	35 years and over	Total
Tuberculosis pulmonary minimal	4	6	6	16
Pulmonary infiltration case undetermined	18	15	18	51
Pulmonary fibrosis undetermined	8	18	2	28
Total	30	39	26	95
Rate per 1000	0.09	0.27	0.48	0.22

only after culturing material from tracheobronchial lavages, the admission of four of the five patients followed the latest of an average of 4.4 interval roentgenographic examinations. The remaining patient remained on duty nine months before admission

TABLE 3 Incidence and total incidence rate by years of service of patients returned to duty 1949

Diagnoses	Years of service group			
	3-5	6-11	12	Total
Tuberculosis pulmonary minimal	5	3	8	16
Infiltration, pulmonary case undetermined	20	12	19	51
Fibrosis pulmonary undetermined	12	11	4	28
Total	37	26	31	95
Rate per 1000	0.10	0.24	0.63	0.22

Length of service of patient not stated

with positive sputum following his second interval roentgenographic examination

As seen in tables 2 and 3 pulmonary infiltration or fibrosis of undetermined cause was diagnosed with greater frequency, during 1949 in the older and longer service groups. This was also true of those who later developed active tuberculosis half of the patients having been in the service from eight to 19 years and in the 25 to 35 year age group and only two having been less than 25 years old and having less than five years of service

TABLE 4 Incidence and total incidence by category of patient returned to duty 1949

Diagnosis	Officer	Medical Corporal	Medical Dental Enlisted	All Enlisted	Total
Tuberculous pulmonary miliary	2	1	1	3	16
Infiltrative pulmonary and miliary	11	5	6	7	31
Fibrotic pulmonary and miliary	4	4	—	4	28
Total	17	10	7	14	95
Per 1,000	0.30	0.13	0.40	0.20	0.22

Table 4 classifies the persons under consideration according to rate or rank. They appear to be fairly well distributed. Although officers and medical and dental enlisted men and women had a somewhat larger proportion of cases than would be expected the numbers are so small that little confidence should be placed on the differences. Those who developed active tuberculosis during the following three years include one chief gunner's mate, one chief aviation man, one electrician's mate, second class, one corporal, one fireman, two chief hospitalmen, one hospitalman, second class, one steward, first class, and one steward's man. The sputum of one of the food handlers was positive; that of the other was repeatedly negative upon culture.

DISCUSSION

Of 95 persons returned to duty after careful clinical evaluation of roentgenographically detected pulmonary lesions described as infiltrative or fibrotic, 10 percent developed active tuberculosis within three years. Because it is not known if all these persons

remained in the service throughout the period of observation, the percentage developing active tuberculosis must be considered the minimum. Furthermore, because half of those who developed tuberculosis did so during the latter part of the period of observation, it is not unreasonable to anticipate that additional cases of tuberculosis, or other disease, will be detected as the period of observation is lengthened. The wisdom of requiring frequent roentgenographic examinations of the chest of persons with such lesions is apparent. It should be noted, however, that examinations made at even 6 month intervals occasionally fail to detect changes in lesions before the sputum of the patient contains tubercle bacilli. Hence, alert medical officers give careful consideration to minor symptoms of illness which arise in the intervals between scheduled re examinations.

Tuberculosis has been one of the great "sea diseases" since decked ships came into use centuries ago.⁵ There is little justification for retaining a tuberculous person in the Navy. When the evidence of tuberculosis is only suggestive, however, as in unchanging roentgenographic shadows of minimal extent, a policy of invaliding such affected persons would cause a loss to the service of many highly trained persons with long experience. The limited experience gained during 1949 suggests that most of those who remain in the service will continue with their health apparently unimpaired for three years. How long they may serve ultimately remains to be observed.

As long as routine roentgenographic examinations of the chest are required, diagnostic titles such as "infiltration, pulmonary, cause undetermined" and "fibrosis, pulmonary, cause undetermined" will be needed. The new titles have proved to have a definite usefulness in providing a classification, other than tuberculosis, for such lesions when bacteriologic, pathologic, or serial roentgenographic confirmation is not obtained. By means of this classification, a relatively small group of persons who require periodic re examinations at short intervals can be readily identified. Furthermore, such groups can be included in subsequent studies to determine what diseases may be expected to occur in the evolution of the lesions. Use of the titles also avoids stigmatization of persons as tuberculous because of inconclusive evidence.

The problem of inactive pulmonary lesions discovered by means of routine roentgenograms is not restricted to the Navy, as is well attested in reports of surveys made in civilian populations.⁶⁻¹¹

CONCLUSIONS

Ten percent of 95 persons with infiltrative or fibrotic pulmonary lesions detected during routine roentgenographic examinations of

the chest who were discharged to duty following careful clinical study in 1949 subsequently developed active pulmonary tuberculosis in the naval service during 1950 through 1952. The remainder served part or all of this period without recognized impairment of health.

The diagnostic titles, infiltration, pulmonary cause undetermined, fibrosis pulmonary cause undetermined, calcification pulmonary cause undetermined, not only are convenient for the classification of patients whose only physical defect after careful clinical study is an unchanging lesion defined in roentgenographic terms but also are useful for the ready identification of a small but significant number of persons who may subsequently develop progressive or communicable disease.

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The Physician's Reward

The most satisfactory reward one gets as a physician is not necessarily financial but the respect of one's patients and one's community. It is the practice of the art which develops that respect.

—MFLVIN A CASBERG M D

Med J Ann l f th D t t f
Col mb p 43 J 1954

LUMBOSACRAL SUBARACHNOID TAP FOR SADDLE BLOCK ANESTHESIA

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SCOTT WHITEHOUSE *Commander (MC) USN*

THIS report describes the details of a technic for saddle block anesthesia which at this hospital has consistently resulted in anesthesia of the sacral nerves

A lumbosacral subarachnoid tap for spinal anesthesia was first proposed by Taylor¹ who used a lateral and caudad approach to the subarachnoid space at the lumbosacral interspace Schuetz² used the Taylor method successfully in 100 urologic patients, but Surks and Wood³ preferred an approach directly lateral to the lumbosacral interspace

METHOD

An inspection of the lumbosacral interspace between the fifth lumbar vertebra and the sacrum (figs 1A and 1B) reveals that it is the largest one in the spine. The lateral and caudad approach is used because the spinous process of the fifth lumbar vertebra usually overhangs the interspace in the midline.

The patient is placed in the prone position with arms above his head, his face turned away from the operator and his legs slightly separated. The skin over the lumbosacral region is prepared and draped in the usual manner. The second sacral foramen is located about 1 cm below and 1 cm medial to the lowermost prominence of the posterosuperior iliac spine (fig 2). Heavy pressure should not be used in palpating because a light touch reveals more of the position of the underlying bony structures. There is usually a definite skin dimple at the site of the posterosuperior iliac spine.

After a skin wheal is produced over the second sacral foramen, using 25 mg of ephedrine in 1 percent procaine hydrochloride, the subcutaneous tissues are infiltrated in the direction of the

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fifth interspace. If the patient is of average size or smaller a 7.5 cm. 20 gauge spinal needle is used. The needle is directed cephalad and medially from over the second sacral foramen toward the lumbosacral interspace at an upward angle of approximately 55° until the point of the needle is felt to enter the subarachnoid space. The drip of spinal fluid is usually active and permits easy aspiration.

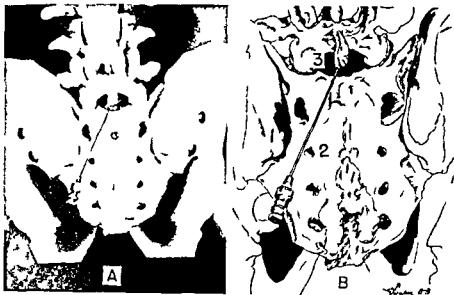


Fig. 1 (A) Photograph of a patient's lower back showing the needle inserted into the interspace between the second and third sacral foramina. (B) Photograph of a patient lying on their side, showing the needle inserted into the lower back.

For all patients a mixture of 0.5 cc. of 1 percent tetracaine hydrochloride and 3.5 cc. of spinal fluid is injected at the rate of 1 cc. per two seconds. This dosage was found to be adequate. The dose was not varied for weight and height.

RESULTS

This method was used on 71 patients at this hospital, the approach described by Taylor being closely followed. The majority of the patients were young men, although some women were included, who ranged in age from 18 to 65 years and in weight from 100 to 208 pounds. They were operated on during a four month period for anorectal disorders and pilonidal sinuses for which a low spinal anesthesia was desirable.

In this series the skin anesthesia extended from the fifth sacral through the second sacral dermatomes and the patient was able to move his legs in every case. There was no nausea or vomiting, possibly because the patient was not required to

sit up during the procedure. There was no significant hypotension necessitating therapy of any kind. Some patients who had had previous spinal anesthetics preferred this method because of the

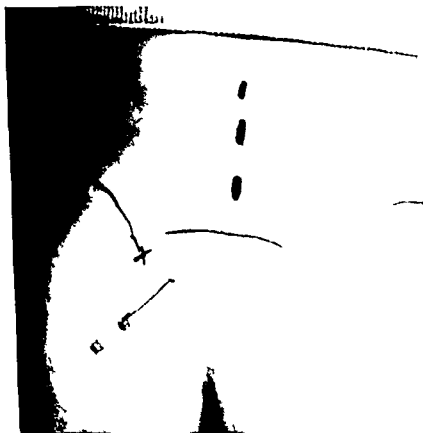


Figure 2 Photograph of patient showing landmarks for Taylor approach. X indicates location of posterosuperior iliac spine. Location of the second sacral foramen and the lumbosacral space can be determined by comparing with figure 1B.

more comfortable position during the procedure of subarachnoid tap. Postoperatively, only one patient complained of a typical postlumbar puncture headache. This was of moderate severity, partially relieved by a tight abdominal binder and subsided spontaneously in three days.

COMMENT

The Taylor method has all the advantages of any saddle block anesthesia, such as avoiding the possible complications of general anesthesia and obtaining the co-operation of a patient able to move his legs. Once the technique is learned, the procedure is easy to perform. Low spinal anesthesia may be obtained uniformly without tilting the patient or using a hyperbaric solution. The patient is comfortable in the prone position during the procedure. No particular difficulty has been experienced with obese patients except that one should use a needle 15 cm in length.

The method has the disadvantages and dangers of any spinal anesthesia but they are minimized if good technic is used. This can be varied to fit special requirements the solution being made hypobaric or hyperbaric and the position of the patient changed to produce any level of analgesia.

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Rupture of the Bladder

If rupture of the bladder is demonstrated immediate surgery is mandatory to prevent further extravasation of urine and to drain perivesical tissue already permeated by urine. This is best accomplished by suprapubic cystostomy drainage of the bladder by a suprapubic tube and drainage of perivesical tissue by Penrose drains in cases of extraperitoneal rupture. The treatment for intraperitoneal rupture should be suprapubic cystostomy drainage of the bladder by suprapubic tube suction removal of urine from the peritoneal cavity and closure of the peritoneum without drainage. If the ruptured area of bladder wall can be closed easily it should be done although this step is less important than those just mentioned. Usually a period of 7 to 10 days of drainage after cystostomy will suffice. At that time the suprapubic tube can be removed and an urethral catheter can be placed to facilitate closure of the surgical incision. If there has been interruption in the continuity of the prostatic or membranous urethra every effort must be made at the time of surgery to splint this segment with a urethral catheter in addition to draining the bladder by suprapubic tube. Suprapubic drainage should be maintained for at least 10 days. The urethral catheter used to splint the ruptured urethral segment should remain for three weeks or longer.

—GEORGE C PRATHER M D

J ur l of th Am M d l
A t p 207 J 16 1954

FAT EMBOLISM

Report of Two Fatal Cases

RODGER L. BUCK *Lieutenant (MC) USN*

THERE are many pathologic conditions more rare than fat embolism, but few that are so often unrecognized clinically. The significant number of cases reported in the literature is of clinical importance, especially in time of war because of the increase in traumatic cases, and physicians should be more alert to the possibility of this condition.

Fat embolism was first recognized by Zenler in 1862, and by 1951 over 650 cases had been reported.¹ Statements regarding its incidence²⁻⁷ vary widely. Fat embolism has been found at autopsy, not only following a major fracture but also after an injury without a fracture, a severe burn, puerperal sepsis, convulsions, or alcoholic delirium.

Most writers support the theory that fat emboli result from the breakdown of fat cells and the extrusion of their contents into adjacent veins and venules.²⁻⁸ This is substantiated by the fact that fat embolism is usually discovered following fractures where veins are encased in a bony wall. Because of their noncollapsible walls, these vessels furnish easy access to fatty substances as soon as hemorrhage and exudation raise the local pressure above that of the venous pressure. Numerous cases, however, cannot be explained by this theory. Fat embolism has been observed following burns, poisonings, osteomyelitis, diabetes mellitus, eclampsia, pancreatitis, tuberculosis, and fatal conditions producing fatty necrosis. Obesity apparently is not a factor in the incidence of fat embolism nor is its severity necessarily related to the degree of injury.

DIAGNOSIS

The clinical picture presented depends largely on the presence of fat emboli in the capillaries of the lungs, brain, skin, and kidneys which is followed by edema, hyperemia, and minute hemorrhages. Signs and symptoms may appear in a few hours but may be delayed for two or three days.⁹ Cerebral signs may vary from slight irritability and excitability to maniacal periods and

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The method has the disadvantages and dangers of any spinal anesthesia but they are minimized if good technic is used. This can be varied to fit special requirements the solution being made hypobaric or hyperbaric and the position of the patient changed to produce any level of analgesia.

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Rupture of the Bladder

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—GEORGE C PRATHER M D
J ur l f th Am M d l
A t p 207 J 16 1954

whole blood and bed rest and 38 hours after admission he was given a spinal anesthetic preparatory to the application of the casts. After being raised to a sitting position to produce a low level of anesthesia, he was returned to the supine position. The systolic blood pressure was 110, and he was moved to a firm table for reduction of the fractures. Within two minutes he coughed several times and his blood pressure fell to 70/0. Two minutes later his heart sounds became inaudible. A tracheotomy, artificial respiration, and direct transthoracic cardiac massage failed, and he died at 1540 on 22 April.

Autopsy findings A fracture of the sternum in addition to the other fractures marked congestion of the lungs, liver and kidneys, and moderate cerebral edema were found. The heart was moderately enlarged but arteriosclerosis was not marked. The lung sections showed a severe degree of congestion and edema, and many pigment-laden macrophages were present. In most of these sections the fat globules were readily recognized within the arterioles and were also found in sections of the pancreas, heart, liver, and kidneys. These were all confirmed by fat-stain techniques. Sections of the spleen, adrenals, bladder, and prostate were essentially normal, and no fat globules were noted. The only pathologic change observed in the brain was cerebral edema.

Diagnoses of cardiac arrest, tetracaine hydrochloride (pontocaine) sensitivity, and massive pulmonary thromboembolism had been considered prior to microscopic studies following autopsy.

SUMMARY

Fat embolism is a common pathologic condition that is usually overlooked. Death following fat embolism may be sudden or delayed. Symptoms may be pulmonary, cerebral, or cardiac. The appearance of pulmonary edema in a patient with a fracture of the long bones should arouse suspicion. A sudden increase in respiration, marked elevation of temperature, cough, cyanosis, dyspnea, and the presence of rales in the lungs are all signs which have been observed. The presence of petechias over the abdomen, chest, neck, and conjunctivas, is particularly important. Associated head injuries frequently present a problem in the differential diagnosis. The pathologic diagnosis of this condition may be suspected from examination of routine hematoxylin-eosin stained sections, but must be confirmed by special fat-stain techniques. The treatment consists of supportive measures, principally that of combating anoxemia.

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Anxiety in Severe Nosebleed

To appreciate fully the anxiety of a nosebleed one must be called at 3 00 a m some morning and go to a patient's house. There you find a large obese patient lying in a bed damp and soggy partly from melted ice and partly from blood. Her nightgown is spattered with blood. There is blood on the floor around a washbasin which is filled with clotted blood and saturated tissues fill a paper bag. The patient is bug-eyed with fear and standing around the bed even more frightened is one two or three relatives each of whom tries desperately to mop every drop yes even every erythrocyte as it trickles from the upper lip.

Then comes the massive emesis! A large clot is propelled up from the stomach and into the basin. This swallowed blood is interpreted by all as being the patient's spleen liver or some other vital organ and an obvious peroral evisceration. This of course is an exaggerated and somewhat comic picture but it testifies to the degree of psychic shock involved in this condition.

Under such circumstances as I have described one should walk into the room and act as though he were completely oblivious to the blood as though that huge basin of blood were mere spotting. Then take the blood pressure pulse and listen to the heart. While the sphygmomanometer is still on the arm slowly inject intravenously meperidine or codeine the dose and drug as indicated. The patient relaxes. Don't burst into the room look at the patient gasp and then frantically start stuffing vaseline gauze down the patient's nose. This type of heroic acting may be appropriate for the situation of an emergency tracheotomy. However this approach to the patient with nosebleed who is already paralyzed with fear is only going to raise the blood pressure to a head throbbing level.

—RICHARD T BARTON

in *Postgraduate Medicine*

p 72 Jan 1954

GUILLAIN-BARRE SYNDROME

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RAY D FOSTER L t na t MC USNR

THE Guillain Barré syndrome is characterized by sensory changes and paralysis with albuminocytologic dissociation in the spinal fluid. Its cause is unknown but infectious, toxic and allergic bases have all been implicated. Recent reports describing the treatment of this condition with ACTH and on one occasion with cortisone in addition to ACTH led us to consider the advisability of a trial of cortisone alone as a therapeutic agent.

CASE REPORT

A 20 year old warehouseman was admitted to this hospital on 16 July 1953 complaining of numbness and tingling of the hands and feet and weakness of the legs and arms. He had been well and strong until 20 May 1953 at which time he was hospitalized here for six days with laryngitis and an upper respiratory tract infection. He was discharged from the hospital on 26 May 1953 and returned to his work feeling well. During the first week in July he noted tingling and burning of the hands and feet followed by a numbness which was severe enough to prevent him from using a typewriter. Shortly thereafter he had difficulty climbing stairs because of weakness of the legs and he noted that he was unable to support his weight on one leg. The numbness, tingling and weakness continued and seemed to the patient to be advancing up the arms and legs. He had been seen at a civilian dispensary during the first week of his illness and treated empirically with vitamins without relief. Because of his progressive symptomatology he was referred to this hospital. There had been no history of headaches, fever, diplopia or dysphagia. No history of exposure to noxious fumes or poisons was obtained nor was there any history of allergy.

Physical examination was essentially normal with the exception of the neurologic findings. The patient walked on a wide base with a stepping type gait. The cranial nerves were normal although taste and smell were not tested. Cerebellar tests showed the finger-to-nose test and the heel-to-shin test to be satisfactorily performed although poorly primarily because of muscle weakness. The Romberg test was questionably positive but his muscle weakness made this a doubtful finding. Kernigs and Brudz

zinski's signs were negative. Tendon reflexes were absent even with reinforcement. The only reflex obtained was the cremasteric, which was normal bilaterally. Generalized muscular weakness was present, with inability to perform dorsiflexion of the toes or the feet, and with weakness in pelvic girdle and in neck movement. The latter was particularly weak in the posterior flexion. The shoulder girdle appeared normal in strength. The patient was unable to rise from a squatting position. At the time of admission the hand grip was weak and he was unable to grasp a pencil. Temperature sensation was present in the hands and feet and in all other body areas. The patient was able to distinguish sharp from dull stimuli in all areas. The character of both of these stimuli changed bilaterally at about three inches below the elbow and at the level of the knee. Vibratory and superficial and deep pain sensations were normal.

On admission, a serologic test for syphilis and a urinalysis were negative and a complete blood count was normal. The sedimentation rate was 17 mm at the end of the first hour. Lumbar puncture on 18 July 1953 showed clear fluid with a cell count of 1 and a total protein of 159 mg percent. Spinal fluid sugar, chlorides, and colloidal gold were normal and the culture was negative. The Pandy test for globulin was positive. The blood non-protein nitrogen was normal. A repeated spinal fluid examination on 5 August 1953 showed no cells, normal sugar, chlorides, and colloidal gold values, a negative culture, a total protein of 98.1 mg percent with a trace of globulin by the Pandy test, and the serologic test for syphilis was negative.

Based on these findings, the diagnosis of Guillain Barre' syndrome was made and confirmed after four days of observation. Because of the progression of symptoms, and of reported successful treatment of this disease with both ACTH and cortisone, we decided to give the patient cortisone. It was begun on the fifth hospital day, orally, in doses of 300 mg per 24 hours. On the following day, the patient reported that he was feeling better and that he had an increased strength in his hands. He was able to write with a pencil for the first time in a week. The paresthesias were unchanged.

The cortisone dosage was continued at the 300-mg level until 27 July 1953. During that time, response to the 300-mg dose of cortisone had been definite, but slight. The eosinophil count was 155 per cu mm. Previous counts had not been done because necessary reagents had not been available at this overseas station. Because of the elevated eosinophil count, the dosage of cortisone was increased to 500 mg daily for two days. The eosinophil count fell in 48 hours to 33 per cu mm and remained below 50 for the following month. Two days after the dosage of corti-

sone was increased the patient felt definitely stronger. He arose on the morning of 29 July 1953, and made his own bed. The cortisone was then gradually reduced in 12.5 mg steps at about three day intervals. The patient's improvement was progressive and gradual with increased strength of the small muscles of the hands occurring more rapidly than in any large muscle groups. Paresthesias diminished slowly and less dramatically than weakness. The lumbar puncture findings on 5 August 1953 were normal with the exception of a total protein of 98 and cell count of zero. On 4 August 1953 cortisone was given intramuscularly because the supply of the oral form was exhausted. Twenty four hours later, he felt weaker, had some increase in paresthesias and experienced definite diuresis. Without change in dosage diuresis and weakness were alleviated and he again improved. Because of an anticipated 30 to 60 day convalescent period it was necessary to evacuate the patient by air to the United States for further treatment. It has been our belief that a course of ACTH given intravenously would be indicated should a relapse occur but to date none has.

DISCUSSION

The prognosis of the Guillain Barre' syndrome is serious with mortality figures quoted at from 5 to 40 percent. Many man hours have been lost during convalescence. Dimercaprol, neostigmine, vitamins and roentgen ray therapy have all been tried but no therapeutic approach has been entirely successful. Published reports hold hope for the use of steroid therapy. The patient reported appeared to obtain a genuine therapeutic response to treatment. This is substantiated by the fact that clinical improvement occurred in parallel to the drop in the circulating eosinophilia indicating physiologic response to cortisone. The change in the patient's condition during the lag period when parenteral administration of cortisone was substituted for the oral administration also suggests therapeutic effect.

While the allergic hypothesis of the cause of Guillain Barre' syndrome is not entirely satisfactory it would appear to offer a more logical explanation of the pathologic findings and the clinical course than other hypotheses. The oral administration of cortisone is less difficult than the parenteral use of cortisone or ACTH. It is particularly suitable for use in relatively small outlying medical establishments.

SUMMARY

A patient with Guillain Barre' syndrome showed improvement on cortisone with an initial dose of 300 mg daily. Subsequently, his improvement ceased but response was again obtained by

increasing the dose to 500 mg daily The results obtained are considered to represent a true therapeutic response

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History of Culdoscopy

Endoscopic examination of the abdominal cavity began about 1910 shortly after the incandescent lamp was perfected with the pioneer reports of Jacobaens and Kelling Even before this cystoscopy had been done with artificial illumination a sort of candling as it were Followed then three decades of trial and error approach to the problem of easy adequate pelvic visualization varying from abdominal puncture with oxygen distension of the abdomen to cul-de sac attack in the completely vertical Trendelenburg in efforts to empty the pelvis of obstructing bowel and bring the operator vis a vis with the remaining pelvic content

It is inspiring to contemplate how man has searched out the little 2 by 4 cm cul-de sac partition left by Mother Nature as a secret passageway for the curious and intrepid intrapelvic explorer Not irreverently we sometimes suspect that the posterior vaginal septum must have been put there precisely for culdoscopy All efforts however left the patient and hence the method on its back until Decker in 1940 elevated a cadaver from prone to knee-chest position to display the open sesame of present day culdoscopy In 1942 he successfully visualized his pioneer live subject in the knee-chest position and a new star was born in gynecologic diagnosis

—BRUCE C. BUDGE M D

in *Northwest Medicine* p 132 Feb 1954

LARGE PRIMARY OMENTAL CYST SIMULATING ACUTE APPENDICITIS

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HARVEY J BLANCHET III *Capt* USAF (MC)

OMENTAL cysts of the peritoneal cavity occur very infrequently and are most unusual when they present symptoms of an acute surgical abdomen. Recently, under the clinical impression that we were dealing with a perforated appendix we operated on a two-year old boy and discovered a large omental cyst undergoing pedicle torsion which was removed without incident.

CASE REPORT

A small two-year-old boy was examined at this hospital on 20 July 1953 complaining of abdominal pain. Two days prior to admission he developed a low grade fever and anorexia but the following day he seemed well. The night prior to admission he complained of cramping abdominal pain and vomited once. On admission he appeared acutely ill and had a temperature of 103° F and pulse of 160 per minute. His face was flushed, but he was not especially dehydrated. The remainder of the physical examination was normal except for moderate distention and tenderness throughout his abdomen. The area of maximum tenderness was over McBurney's point where referred pain and rebound tenderness were marked. A few high pitched peristaltic sounds were heard. Rectally the tenderness was greatest high on the right side of the pelvis. The urinalysis was negative and the leukocyte count was 27,000 with a marked shift to the left. A roentgenogram of the chest was within normal limits. Roentgenograms of the abdomen showed an area of homogeneous density occupying the entire right side and the lower half of the left side. A few loops of gas filled bowel were noted in the left upper quadrant (fig. 1).

We believed this was most likely a case of peritonitis due to a ruptured appendix. Suitable preparation with intravenous fluids and antibiotics was carried out and the patient was taken to surgery. Under ether anesthesia, the abdomen was opened through

a right lower rectus muscle-splitting incision. A huge blue cyst (fig 2) was encountered which appeared to arise from the greater omentum on the right side and to be attached between the greater



Figure 1 Roentgenogram of the chest and abdomen showing an opacity throughout both the lower and the right upper abdominal quadrants. A few gas filled loops are seen in the left upper quadrant.

curvature of the stomach and the transverse colon. It had pushed the small intestines into the left abdominal cavity. During dissection we were able to untwist the pedicle, and the color of

the cyst returned to a healthy pink. After mobilizing the stomach and transverse colon, the entire cyst and pedicle were removed intact. An incidental appendectomy was then performed and the abdomen closed in routine manner.



Figure 2. Omental cyst weighing 325 grams and measured 20 by 17 by 5 cm removed from the abdominal cavity of a two-year-old boy.

The patient immediately improved, and was discharged on the fourth postoperative day. Recovery has been entirely uneventful and the wound is completely healed.

Multiloculated and filled with a fibrin and serum like substance the cyst weighed 325 grams and measured 20 by 17 by 5 cm though partially collapsed due to the escape of some of the fluid. On section it was found to be composed of a thin layer of fibrous tissue lined with endothelium. There was an acute diffuse inflammatory reaction throughout. The pathologic diagnosis was omental cyst with acute inflammation. The appendix was normal.

Subsequently the patient's mother disclosed that he had always had a prominent abdomen. He had been considered a feeding problem because of vomiting which necessitated frequent formula changes.

DISCUSSION

Behrs and Dockerty¹ have classified omental tumors as primary solid and cystic tumors and secondary cysts. The latter may be due to fat necrosis or may occur following trauma with hematoma formation and subsequent liquefaction. Others may be formed about foreign bodies left in the abdomen or be due to an hydatid cyst.

Symptoms produced by omental cysts are not pathognomonic. Montgomery and Wolman² have noted that those caused by such lesions generally fall into one of three groups. In the first group, they are due to the size of the tumor which causes abdominal enlargement. In the second group, symptoms are produced by torsion of the pedicle or rupture of the cyst. This group usually is operated on under the diagnosis of an acute abdomen. The third group includes asymptomatic patients in whom the condition is incidental to a surgical procedure or found at autopsy.

Of 29 cases of omental cysts reported by Beahr and Dockerty, 22 were asymptomatic and were discovered incidentally during an operation or at autopsy. Of the remaining seven, five were primary and producing symptoms. In this latter category, the pre-operative diagnosis was appendicitis in one patient, and abdominal enlargement of undetermined causes in four. Fitts and Harvie³ also reported a case of primary omental cyst masquerading as acute appendicitis.

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Psychiatry and the Practice of Medicine

Whether he knows it or not, every physician uses psychotherapy. It may be good or bad, depending on his attitudes, actions and reactions, his conduct, his ability to listen, his knowledge in knowing what to say and when to say it. If and when psychiatric knowledge of this all important phase of professional work can be imparted more adequately and more clearly to medical students, we can expect a further improvement in the practice of medicine. It is a part of the "art" of medicine, but now much of it can be taught.

—WILLIAM C. MENNINGER, M.D.
in *Psychiatric Bulletin*
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UNUSUAL FINDINGS IN VAGINAL EXAMINATION FOR SUSPECTED PLACENTA PRAEVIA

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TWO instances of unusual findings on vaginal examination of patients with vaginal bleeding late in pregnancy are reported in this communication.

All patients with vaginal bleeding in late pregnancy are admitted to the hospital and put to bed. Specific examination is deferred until blood loss has been treated by transfusion. With the cessation of bleeding placentography is accomplished. Following this sterile vaginal examination is performed in order to confirm the presence of placenta praevia not defined by placentography or to uncover less serious causes of bleeding. With marginal placenta praevia, under appropriate circumstances such as continued bleeding, adequate dilatation of the cervix, and viability of the infant, the membranes are ruptured in order to induce labor or if labor is in progress to produce tamponade of the placenta by the vertex. Patients with total or practically total placenta praevia are treated by cesarean section.

The technic of vaginal examination is as follows. With whole blood available, an intravenous infusion of saline is started and a sterile examination performed. The vaginal fornices are first explored and any boggy or irregularity of contour noted. Following this the external os is very gently palpated with simultaneous pressure on the fundus of the uterus. Attempts to visualize the cervix are withheld until digital examination has been accomplished.

CASE REPORTS

Case 1. A 24-year-old para 1 gravida 4 abortus 2 was admitted on 8 March 1952 with a history of spotting throughout her pregnancy and vaginal bleeding approaching the amount of a normal menstrual period for three to four days prior to admission. She

was an unregistered patient and had had no prenatal care Her last normal menstrual period was about the middle of August 1951, and her expected date of confinement, late May 1952 Her past history revealed one full term pregnancy in 1947 with a 24 hour labor and the normal delivery of a six pound infant, now living She then had two successive spontaneous abortions at four and one half and five months, in 1950 and 1951, respectively

Admission examination revealed a small fetus, consistent with the menstrual history, in a vertex presentation with the presenting part floating The hematocrit was 36 percent, hemoglobin, 12 grams, and red blood cell count, 4,160,000 Urinalysis was within normal limits Bleeding was minimal at the time, and the uterus was soft and not irritable

Bleeding had ceased the day after admission, and placentography was done This was reported as showing the placenta lying posteriorly and to the left, not thought to be a praevia, unless a marginal one " It was decided to keep the patient on bed rest and allow the baby to develop further, as long as the bleeding was not marked She was given 1 gram of ferrous sulfate daily in addition to supplementary vitamins and a high protein diet She continued to pass large clots every two to three days The hemoglobin and hematocrit remained within normal limits Cross matched blood was also constantly available During this period, the vertex descended into the pelvis under the force of frequent Braxton Hicks contractions

On 8 April 1952 active bleeding recurred and several large clots were passed Because the fetus now appeared to be viable, it was decided not to delay the vaginal examination Sterile vaginal examination was done as previously described The fornices were gently explored and found to be boggy posteriorly and on the left. The cervix was then gently palpated and the external os noted to be almost completely effaced and about 5 cm dilated An irregular margin of placenta covered the os on the left. The vertex was at the ischial spines and in a right occiput anterior position About three fourths of the cervical opening was thought to be covered by thin membranes, through which the sutures of the fetal skull were readily palpable The membranes were then artificially ruptured and about 100 cc of clear amniotic fluid allowed to escape The vertex immediately descended and acted as a tamponade against the placental margin There was no bleeding during the procedure The uterus, previously irritable, began to contract mildly

Fifteen minutes later the patient had two strong uterine contractions and precipitously delivered a living premature infant

weighing three and one half pounds over an intact perineum and without anesthesia. The placenta was delivered by simple expression. Examination of the placenta revealed an hiatus the size of the fetal head, about 6 to 7 cm from the lateral margin. This area was extremely thin with a few bits of shaggy tissue adherent to the chorionic surface. This extremely thinned out portion of the placenta had been mistaken for membranes at the time of vaginal examination and was the "membranes" which were artificially ruptured and through which the infant was delivered. The total blood loss at delivery was estimated at no more than 100 cc.

The patient's subsequent course was afebrile and uneventful and she was discharged on the fourth postpartum day. The infant was kept in the hospital for a short time following the mother's release then was discharged in good condition.

Case 2 A 25 year old para 3 gravida 4 was admitted on 4 June 1952 with a history of a gush of bright red blood mixed with water about seven hours prior to admission that occurred while she was voiding. The patient noted continued vaginal bleeding throughout the day with leakage of fluid and the passage of occasional clots. There were no contractions. Her last normal menstrual period was 1 October 1951 and her estimated date of confinement 8 July 1952. Two and one half weeks prior to admission she noticed a bloody vaginal discharge for one day. Her first prenatal visit was on 26 May 1952. At this time the results of the examinations were an adequate pelvis, chest roentgenogram, cervical smear and Kahn test negative, blood type A Rh positive, hemoglobin 11 grams and urinalysis within normal limits. The average blood pressure was 110/70.

Past history revealed a full term baby weighing seven pounds, born of her first pregnancy. The infant died shortly after delivery and she was told that the afterbirth came first and the baby didn't get enough blood. She was not given a blood transfusion at that time. The second and third pregnancies were full term and uneventful. Both of these children are alive.

On admission her blood pressure was 92/60, pulse 84, temperature 99° F and respiration 18. A small fetus presented in the left occiput transverse position with the presenting part floating. Hemoglobin was 12.1 grams, hematocrit, 36 percent, red blood cell count 3,750,000 and urinalysis within normal limits. On the day of admission the patient bled enough to soak one perineal pad every two hours. The following day the hemoglobin was 9.3 grams and the hematocrit 31 percent. Blood had been cross matched on admission and she was given a 500 cc transfusion which raised her hemoglobin to 11.5 grams. Her bleeding persisted intermittently during the day.

It is conceivable that due to the inherently poorer blood supply in the area of the cervix the placentas of both patients did not reach full development in that portion which covered the internal os or the continued pressure of the presenting part may have caused a pressure necrosis of the villi in that area. It may be that these conditions contributed to the poor development of the villi in the portion covering the cervix.

SUMMARY

Two patients with total placenta praevia both managed conservatively presented unusual findings on vaginal examination. On initial pelvic examination the condition was incorrectly diagnosed as marginal and partial placenta praevia, respectively. One patient was delivered vaginally without difficulty and the other was treated successfully by low cervical cesarean section.

Cholesterol in Atherosclerosis

Not so long ago it was widely held that arteriosclerosis and the particular variety called atherosclerosis was an essential part of aging. The result was a defeatist attitude and a regrettable lack of research interest. Now, however, it is clear that age alone does not bring with it the cholesterol deposits in the arteries that currently constitute the basic cause of more deaths in the United States than any other disease category.

Atherosclerosis is a progressive development and it seems highly probable that the eventual appearance of clinical coronary disease usually represents the cumulative effect of a factor or factors operating over a period of years. Age per se is certainly not the cause as is evident from the great variations between individuals of the same age in spite of a general *average* progression with age. Many factors are probably involved in the atherosclerotic development and in the clinical appearance of coronary heart disease but there is no longer any doubt that one central item is the concentration over time of cholesterol and related lipids and lipoproteins in the blood serum. No other etiological influence of comparable importance is as yet identified.

—ANCEL KEYS Ph D

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INVOLUTION OF THE THYMUS FOLLOWING SEVERE BURN

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IN 1928, Marine¹ suggested that a reciprocal relationship exists between the size of the thymus and of the adrenals. Clarification of this problem was delayed until potent adrenocortical hormones became available for general clinical and experimental use. Dougherty and White² showed that in animals the total mass of lymphoid tissue varies inversely with the activity of the adrenal cortex. Selye³ pointed out that involution of the thymus and of other lymphoid tissue is a prominent feature of the "alarm reaction." That this reduction of lymphoid tissue is under the control of the adrenals is indicated by the fact that it can be prevented by hypophysectomy or adrenalectomy or, in the absence of these glands, it can be elicited by adequate doses of adrenocortical hormones.

This report includes our observations of the involution of an enlarged thymus which was roentgenologically demonstrable, in a severely burned patient.

CASE REPORT

A three-week old girl received burns of the face, the upper extremities and the chest when her crib caught on fire. Roentgenograms of the chest, taken when the infant was one week old because of dyspnea and cyanosis, showed a well circumscribed density in the right lung field consistent with a congenitally enlarged thymus gland. The dyspnea and cyanosis subsided within four days and the patient was sent home. The mass, however, was unchanged at the time of discharge and on a follow up roentgenogram which was taken six days later and two hours before the infant was burned (fig 1).

The patient was admitted to this hospital 10 hours after the accident. She appeared to be well developed and weighed about seven pounds. There were partial thickness burns over the en-

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the face the neck and both arms and full thickness burns over both hands parts of both arms and a 6 by 8 cm area on the chest. An estimated 20 percent of the body surface was burned



Fig 1 Roentgenogram of chest 4 hours before he was burned

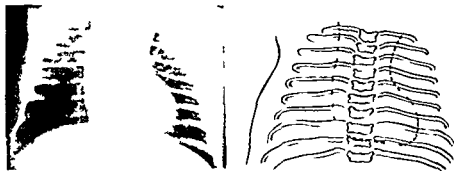


Fig 2 Roentgenogram of chest 15 hours after the infant had been burned

There was no evidence of respiratory tract injury other than that her respirations were rapid and shallow she was slightly cyanotic and oxygen therapy was necessary for the first 72 hours. Fluids were given in accordance with the suggestions of Kyle and Wallace for the treatment of burned children. The signs and symptoms of circulatory insufficiency and water and electrolyte deficit were never evident. ACTH or cortisone were not given at any time. A roentgenogram taken about 15 hours after the infant had been burned revealed the mass in the right lung field to be definitely smaller (fig 2). Eosinophil counts and steroid excretion studies unfortunately were not done.

Twelve days after the injury all full thickness burned areas were debrided and 48 hours later skin grafts were applied to the burned areas of the upper extremities. At the same time four fingers of the left hand which were charred were amputated at

the metacarpophalangeal joints. The full thickness burn of the chest was grafted 14 days later. All of the burns healed with a minimum of scarring. The burns of the face were deep dermal in character and healed without grafting. The patient was completely healed 55 days after burning. A roentgenogram taken 87 days after injury showed enlargement of the mass in the right lung field (fig. 3) and another taken 15 months after injury showed persistence of the mass. The child has remained symptom free.



Figure 3 Appearance of chest 87 days after infant had been burned.

DISCUSSION

Although status thymicolymphaticus has been mentioned in the literature for over 400 years, its existence as a separate entity is doubtful. The diagnosis is usually made at autopsy in patients who have died suddenly after minor trauma or disease. The outstanding pathologic features in these patients are enlargement of the thymus and of other lymphoid tissues, and hypoplastic adrenal cortices. Inability of the adrenals to respond to stress has been proposed as an explanation of death. It has been demonstrated, however, that thymic enlargement occurs frequently in normal children and that, in the great majority of instances, this does not impair resistance to stress. The patient described in this report had an enlarged thymus and withstood well the severe stress of a burn.

Thymic enlargement has been reported in over 50 percent of patients who have myasthenia gravis and good results have been reported in some of these patients after thymectomy. Because of this observation and because of the inverse relationship between lymphoid tissue and adrenocortical activity, ACTH has been given to patients who have myasthenia gravis, both those with and without thymic enlargement. In five patients who had myasthenia gravis associated with thymic enlargement, Soffer and associates¹ noted a decrease in the size of the thymus after ACTH therapy (50 mg daily given intramuscularly for from four to 16 days).

Nonspecific stress the specific stress of burning ACTH and adrenocortical hormones are known to cause involution of lymphoid tissues of which the thymus is a part. In all of these lymphoid involution is mediated through the adrenocortical hormones.

The roentgenogram of the chest taken 15 hours after the injury revealed definite shrinkage of the mass previously observed. In all probability it was an enlarged thymus. Its rapid shrinkage apparently was brought about by the increased secretion of adrenocortical hormones initiated by the stress of burning. This appears to be a dramatic visible structural change caused by a specific physiologic response to stress.

Because roentgen irradiation can cause involution of the thymus the total irradiation received by this infant has been calculated. Six roentgenograms were taken before injury at an approximate dose of 8 of a roentgen unit per film the patient thus received a total of 48 r u prior to the burn. This is far below the minimum of radiation necessary to cause an involution of the thymus.

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Coronary Disease in Physicians

Coronary heart disease illustrates well the problems in evaluating the health status of doctors. The data available for the most part seem to substantiate the commonly held concept that coronary disease is the doctor's occupational disease. This is a plausible assumption when one considers the burdens on the doctor in a society in which few people are free of insecurity and anxiety. Dublin states: "For two of the important causes of death—cancer and diseases of the coronary arteries and angina pectoris—the mortality of specialists as a unit is not much better than that of the nonspecialists." Apparently whatever benefits specialization may bring they are not enough to overcome the tensions of medical practice in general.

—HERBERT K ABRAMS M. D.

GP p 46 J 1954

REFLEX ANURIA

Report of a Case

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ACCORDING to Lattimer¹ there are three general factors which produce anuria (1) extrarenal, (2) renal, and (3) post-renal. Combinations of factors may occur. Reflex anuria may be renal or post-renal. A survey of the literature revealed a paucity of reports of reflex anuria following retrograde pyelography. A recent report by Tomlin and Quilter² described such an incident in a patient who was treated by epidural blocks and made a good response.

This communication is a report of a case of reflex anuria occurring in a patient with Raynaud's disease and scleroderma following a retrograde pyelogram.

CASE REPORT

A well developed, well nourished, 46-year old man was admitted to this hospital on 20 October 1952 for evaluation of his Raynaud's disease and scleroderma. His chief complaint was ulceration of his fingers and pain in his toes. There was increased pigmentation, wrinkling, thickening, and lack of elasticity of the skin, which over the tips of the fingers and toes was especially thick, red, shiny, cold, encrusted, and ulcerated. Blood pressure was 160/80 on admission, but subsequent determinations were in the vicinity of 130/85. Peripheral pulses were normal.

In the course of a thorough workup, an intravenous pyelogram was obtained. This revealed a possible filling defect in the right middle calyx and poor detail on the left. On 10 November a bilateral retrograde pyelogram was normal. No difficulty was encountered in carrying out the procedure. On return to his ward from the urology clinic he experienced considerable bilateral, posterior flank pain requiring repeated sedation during the ensuing 24 hours. Because by the following morning he had not urinated and catheterization was not productive of any bladder urine he was transferred to the urology service. An indwelling catheter was inserted. Blood pressure at this time was 170/120.

He was still experiencing pain in both flanks and examination revealed moderate tenderness in the posterior flanks bilaterally

He was given rapidly 1 000 cc of 5 percent dextrose in water containing 1 gram of procaine intravenously without effect Therefore a continuous spinal anesthetic of tetracaine hydrochloride (pontocaine) was given This was discontinued after four hours because there was no change in the patient's status The anesthesia persisted for two more hours but he remained anuric

Total fluid intake (intravenous and oral) for the first 24 hours following the patient's transfer to the urology service was 2 100 cc Subsequently he was placed on a daily fluid intake of 750 cc plus output He continued to have bilateral flank pain requiring sedation He excreted only a few cubic centimeters of bloody urine in the two days following the retrograde pyelogram

About 54 hours following the retrograde pyelogram he began to excrete bloody urine with a specific gravity of 1 011 In the ensuing four hours he excreted 500 cc of urine Diuresis continued for approximately 24 hours following which urinary excretion was normal although gross hematuria continued for five days and microscopic hematuria for about two weeks Fluid intake was increased to normal following onset of diuresis

The blood urea nitrogen which had been normal on admission was 39 mg percent 24 hours after onset of anuria and reached a peak of 71 mg percent 48 hours after onset of diuresis Five days after onset of diuresis the blood urea nitrogen was 17 mg percent Other laboratory studies including electrolytes were essentially within normal limits

Except for mild headache the patient became asymptomatic and was discharged on 21 November 1952 He has continued to receive therapy for Raynaud's disease and scleroderma over the past year Follow up urinary tract studies during this period have revealed no evidence of a residual pathologic lesion

DISCUSSION

The pathologic physiology involved in anuria resulting from ureteral trauma is not well defined It would seem to be on the basis of a reflex neural stimulation producing renal shutdown However the experimental evidence is contradictory Trueta and associates¹ reported a vascular shunt by way of the juxtamedullary vessels following sciatic stimulation in animals resulting in cortical ischemia and anuria Subsequent experiments by Barrie and co-workers and Moyer and Handley did not support this theory

The present case apparently represents reflex anuria from ureteral catheterization. The ureteral trauma was minimal because the procedure itself was carried out with relative ease and was not prolonged. Whether the existing Raynaud's disease and scleroderma in the patient had any bearing on the development of reflex anuria is only problematical.

SUMMARY

A patient with Raynaud's disease and scleroderma developed reflex anuria following a retrograde pyelogram. Procaine given intravenously and tetracaine hydrochloride given continuously for spinal anesthesia were without effect. The onset of anuria was immediate following the retrograde pyelogram. Diuresis occurred spontaneously 54 hours later. Recovery was complete. Retrograde pyelography is ordinarily an innocuous procedure but is not without a rare complication.

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Medical Library Association Meeting in June

The Medical Library Association will hold its fifty third annual meeting in Washington, D. C. 15-18 June with headquarters at the Statler Hotel. The Armed Forces Medical Library will act as official host. The agenda will include discussions on medical research by embassy attachés, tours of the National Institutes of Health, the National Naval Medical Center, and the Armed Forces Medical Library, and addresses by Dr. Detlev Bronk, President of the Rockefeller Institute of Medical Research; Lt. Col. Frank B. Rogers, Director of the Armed Forces Medical Library; Mr. Verner Clapp, Acting Librarian of Congress, and Dr. Raymond Zwemer, Chief of the Science Division, Library of Congress.

Miss Marian Dondale, Librarian at the Albany Medical College Library, Albany, N. Y., is president of the Association and the president-elect is Miss Wilma Troxel, Librarian at the University of Illinois Medical School Library, Chicago, Ill.

Senator Hunt Examines Patient During Visit to Dental Clinic

On a recent inspection of the U S Air Force Dental Clinic at Bolling Air Force Base Washington D C United States Senator Lester C Hunt of Wyoming momentarily resumed the practice of dentistry with a patient from his own state Airman Thomas A Ries of Cheyenne a tuba player at the United States Air Force Bandsman School was awaiting an appointment in the clinic when the senator and his party arrived They were introduced by Colonel Jack M Messner USAF (DC) commander of the 1100th Dental Squadron and Senator Hunt examined the airman



Senator Lester C. Hunt (right) is shown with Colonel Jack M. Messner USAF (DC) examining the 1100th Airman Thomas A. Ries

The group accompanying Senator Hunt included Dr Henry F Canby Dental Director U S Public Health Service Dr Daniel F Lynch Washington D C President-elect of the American Dental Association and Dr Rudolph H Friedr ch Plainfield N J Chairman of the Federal Dental Services Committee of the A D A

Senator Hunt a member of the Senate Armed Services Committee graduated from the St Louis University College of Dentistry in 1917 and after serving in the U S Army during World War I practiced for many years in Lander Wyo He is a Fellow of the American College of Dentists and former president of the Wyoming State Dental Society

DOCTORS FOR THE ARMED FORCES

REAR ADMIRAL LAMONT PUGH
Surgeon General U S Navy

IN the period since the end of World War II the Medical Department of the Navy has undergone certain changes not only to keep abreast of the times and fulfill its mission but also to enhance its attractiveness in the estimate of the medical personnel upon which it has to rely in the fulfillment of its mission

Since 1945, the Nation's medical schools have graduated eight classes with an average yearly output of approximately 5,850, totaling some 46,800 doctors. Those post-World War II doctors are distinguished upon three notable counts. First by reason of a precise and exacting screening standard, those who have gained admittance to medical school during this era have attested to their scholarly superiority. Second, these individuals have through inherent intelligence and diligence of application in basic training and postgraduate pursuits, brought to medicine the highest degree of professional erudition, skill, and competence attainable by so youthful an aggregation in this or any other country. Third, these doctors despite all the efforts and measures designed to influence them favorably, have shown conspicuously little relish for service with the Armed Forces. Various reasons or explanations have been advanced for this lack of enthusiasm to enter the Medical Corps of the Army, Navy, or Air Force. One reason, and a commendable one, has undoubtedly been the eagerness of these young physicians to acquire the professional excellence mentioned above. However, it will neither be contended that there is ample evidence against this being the only reason, nor will additional reasons be advanced. Rather let's review the record of medical officer procurement during the post-World War II era. While this review relates primarily to the Navy, the particulars cited are applicable to the Army and Air Force.

Immediately following the cessation of hostilities in August 1945, there promptly ensued a general exodus from the Medical

Department similar to that from all other departments of the Navy. The abandon with which this general demobilization as it related to medical personnel could be allowed was conditioned by the necessity of retaining sufficient doctors on active duty to perform physical examinations upon the homeward bound legions before their separation from the service.

In any event school was out and within a short period the ranks of the Medical Corps had been depleted to a minimum irreducible in the estimation of our planners. This however was considerably before all of those of a nostalgic turn of mind had been accommodated and so as early as 1945 the resort to some expedient to either hold or recall sufficient doctors to meet the basic needs of the Navy's Medical Department had become necessary. Up to this time these personnel needs have continued to be provided by a succession of expedients. Most of us will agree that sufficient time has now elapsed to permit us to determine fairly definitely just what is the situation and the *raison d'être* as well. Similarly it will be agreed it is thought that not only has sufficient time elapsed to justify remedial action but that a failure to institute such action after viewing the state of affairs realistically would constitute a serious dereliction.

Navy V 12 Coll g T g Program

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We as a nation have come to represent the world's most important bastion between the way of life created by our forefathers and a diametrically opposed philosophy. We are looked upon by many people of the world as the chief defenders of their faith and the chief holders of their hopes. It rests upon this

Nation to maintain a potent national defense establishment, if we would insure ourselves and those dependent upon us against serious reverses. It is an accepted axiom of a military organization that its cardinal mission in time of peace is to prepare for war and its most unequivocal responsibility is to be ready for war when and if it comes. If that concept is valid for the military services as a whole, it is equally valid for any individual department thereof—in the instance in point, the Medical Department.

There is no resource more important in the maintenance of such an establishment than the men and women who constitute its personnel. There is no entity related to personnel of more vital concern to us than the health of that personnel. Whether prompted by humane instincts, patriotic impulses, or the law of the land, it goes without saying that the adequate protection of this important element rests squarely upon the medical departments of the Armed Services. Provision of a sufficient number of properly trained medical personnel for service in the Armed Forces is a matter of paramount concern to their administrative heads. While it is the administrative medical heads to whom reference is made, the top Line echelons of the services, along with the members of their secretariats, would take the initiative and demand of Congress that ways and means be found to provide adequate medical coverage for personnel in uniform if it appeared that the medical directors and operational planners were unable to cope with the situation.

Any system fraught with uncertainty or with the quality of hit-or-miss is unacceptably faulty and cannot be countenanced by those responsible for military planning. The Armed Services medical department should not have to wonder where or how they will obtain a sufficient number of medical and dental officers and nurses to meet their needs any more than the Ordnance Department would wonder about the source of supply for a sufficient number of gunners or the Bureau of Ships over a sufficient number of personnel to man and fight the vessels of the Navy.

From the close of World War II up until September 9, 1950 (the date Public Law 779, 81st Congress, the doctors' draft law, went into effect) the Medical Department of the Navy (and undoubtedly a similar situation has existed in the Army and Air Force) had no assurance that an adequate supply of medical and dental officers would be available. Until the passage of the doctors' draft law, our planning had been fraught with distinct uncertainty. Reliance for any significant number of dentists and medical men has depended upon a succession of pump priming or stopgap devices—a succession, as has been said, of expedients. From the outline of some salient factors and figures given on the page opposite we see that only 4,778 of 11,176 who started the pro

gram actually were available On May 29 1946 the Secretary of the Navy issued an order to hold 2 000 of the above on active duty

In 1947 Public Law 365 was enacted Title II of that law provided for appointments in the regular Medical Corps at advanced rank on the basis of professional age and experience Sixty two physicians have been commissioned in the Regular Corps under this authority Separation from the service except for physical and other statutory reasons was discontinued The retention of retired officers on active duty was permitted

In December 1948 the American Medical Association addressed a letter to each of 7 610 doctors in the United States who were then less than 26 years of age urging them to volunteer for active duty Special reference was made to those who had received all or part of their medical education under the Navy College Training Program or the Army Specialized Training Program The letters pointed out their liability for induction under the Selective Service Act passed earlier that year and gave other pertinent information Cards were enclosed for the recipient to fill out and return to the A M A They in turn forwarded the cards to the Surgeon General of the appropriate Armed Service The Bureau of Medicine and Surgery addressed a letter to each of the doctors from whom a card was received and gave complete information on how and where to apply for a commission and active duty To those not holding commissions in the Medical Corps Reserve the Bureau of Medicine and Surgery prepared an application letter including a franked envelope addressed to the nearest Office of Naval Officer Procurement To obtain the application forms all that was necessary on the part of the recipient was to sign and mail the letter A copy of the Bureau letter to each of these young doctors was sent to our District Medical Officers and the appropriate officer in-charge of Naval Officer Procurement in order that they might contact each doctor and assist him in every possible way Only 33 medical officers out of 7 610 receiving the letter came on active duty for a period of two years as a result of this program

In February 1949 the Secretary of Defense inaugurated a moral suasion* program directed to those who had received V 12 or ASTP training and who had not subsequently served on active duty Letters and telegrams were sent to approximately 11 000 physicians and dentists 8 681 replies were received In response to this appeal 583 physicians and dentists (5 5 percent of those contacted) volunteered for active duty for a period of 24 months in either of the three Armed Services Of that total 192 medical officers volunteered for duty with the Navy

In 1950 Public Law 779 the doctors draft law was enacted

In spite of the above mentioned efforts, the Regular Navy Medical Corps has suffered a 25.6 percent reduction in strength during the past eight years, a net loss of 503 members from a strength of 1,961 on July 1, 1945 to 1,458 on July 1, 1953. While the Navy has not resorted to Selective Service for any physicians, but for the stimulus of the draft law its medical officer shortage would long ago have become intolerable.

In an effort to make the service more attractive and encourage all categories of medical department personnel to volunteer for service, a number and a variety of measures have been instituted. For this discussion account will be taken only of the measures that have been implemented in the interest of attracting a larger number of physicians and dentists to serve with the Armed Forces for a limited period or as a career. Some of the more important of these measures which are still in effect may be listed as follows:

- 1 Improvement of the medical intern program and the inauguration of a dental intern program
- 2 The establishment of a residency training program
- 3 Liberalization of the postgraduate training program in (1) naval hospitals (2) civilian hospitals
- 4 Short-term training in military medical specialties
- 5 Special courses in the various specialties in civilian institutions
- 6 Extra compensation of \$100 per month
- 7 Discontinuation of professional examination for appointment.

A number of other inducements have been offered but abandoned. One inducement was the privilege of accepting a commission while completing a residency of one, two, or three years in civilian hospitals with full pay. A similar policy at one time affected internships being served in civilian hospitals.

The doctrine of the service as an honorable way of life has, moreover, been consistently proclaimed through one medium or another from one source or another. It has been held that this way of life is one that, along with many signal and unique attractions, carries with it a pay scale by which beginners with dependents may realize a yearly income of \$6,017.28, with the prospect of promotion (practically all of the deserving are promoted) through the ranks of lieutenant at an annual salary of \$7,273.92, of lieutenant commander at an annual salary of \$8,724.00, and of commander at a salary of \$9,640.56, to that of captain in about 16 years at an annual salary of \$10,707.60 increased to \$12,130.32 at the end of 30 years service, and with

a fair chance of attaining the rank of rear admiral in from 20 to 25 years at a yearly salary of \$14 852 64 The mean net annual incomes of civilian physicians in the years 1949 1950 and 1951 were \$11 058, \$11 538 and \$12 518 respectively While these earnings may appear to be in excess of the average pay realizable by service doctors the cold fact has been repeatedly cited that before the civilian can make a cent for himself it is necessary for him to obtain from his patients enough money to pay the office rent pay the nurse pay the stenographer pay his public relations club bills where he must put in an appearance and show evidence of his material well being and pay the installments on his home as well perhaps as upon his car The fact that a career in the service presents a means of enjoying comfortable residence both at home and abroad interspersed with periods of wide travel and residence in foreign lands under conditions of exceptional circumstance and dignity in the far flung reaches of the world and at an early age that would make it possible for individuals to enjoy their experiences in retrospect for a long time has been pointed out And finally that this way of life holds out the prospect of years of contented retirement and provides through medical care hospitalization and retired pay a safeguard against one's ever becoming a burden to himself his family his relatives or his friends has moreover been emphasized

The results of these endeavors and many others have fallen far short of their objectives and have failed to obviate the necessity for the enactment and reenactment of a doctors draft law (now Public Law 84 83rd Congress)

The purpose of this treatise is not to point to the past except to provide a clearer concept nor to cite a cause for our ills except to aid in the development of a remedy The purpose of this presentation is to propose consideration of certain measures believed to be in order and urgently needed and to suggest a choice of these measures as the most feasible approach to a problem with which the medical services of the Armed Forces have been confronted for the past eight years

A view that our difficulties would vanish under either an all out war or the economic squeeze of a depression has been advanced Its validity is not doubted However a plan which depends upon calamity for its *modus operandi* should be abhorred

The ideal solution to this whole problem could be realized through circumstances under which civilian and military medicine might work out a cooperative plan that would satisfy all interested agents and agencies This could be realized only if it were possible for the Association of American Medical Colleges and the American Medical Association along with the American

Dental Association and American Association of Dental Schools, to control the production and distribution of the physicians and dentists in America and thus guarantee an adequate supply to the Armed Services. In the light of past experience the realization of such an ideal seems unlikely unless the draft law continues.

The Draft Act *per se* is not an altogether objectionable device. To be sure, it relieves the individual of the responsibility for making up his own mind and initiating his own acts. There is a certain element of fairness to those concerned under the draft law. Under the Draft Act an individual becomes a pawn waiting for an extraneous force to move him. Under this system, when State and National Advisory Committees to Selective Service function, the military avoids the unpleasant accusations of being ruthless, extravagant, and inconsiderate of civilian needs.

Aside from the idea that the services deprive communities of doctors, civilian groups occasionally lose sight of the fact that the Armed Services belong to them. Some of the local citizenry think of the service as a oneway proposition. It is little short of amazing that they frequently fail to consider the fact that their local doctor will return to them, unless some unforeseen circumstance supervenes. Moreover, he will return a more valuable doctor because he has been in the service. In the event of a variety of disasters, the special training available in the Armed Services would stand the local doctor and his community, in good stead.

On the other hand, the odium or opprobrium inherent in the necessity for the Government to point its finger at a particular group of citizens in a democratic country to induce its members to render a service ordinarily expected is not mitigated. Neither does such an arrangement promise to end the bickering between civilian and military representatives over what constitutes an adequate supply and how the military should employ its doctors. It would appear worthy of mention that by 1955 the prospect seems good of obtaining a sufficient number of physicians and dentists to meet the needs of the Armed Services through the simple instrumentality of the Selective Service System as currently operative, irrespective of a doctors' draft law. The reason for this is that a large percentage of those who have comprised the output of graduates from the medical schools of the Nation during recent years have been veterans and were therefore exempt from Selective Service.

Age and motivation are two objections to a draft law as an instrument for the procurement of physicians and dentists. It is possible even probable that some doctors would welcome being drafted into the service, the majority of those drafted, however, put on a uniform with reluctance, accept the ordeal as a sentence

to be served. They carry out their work in an unhappy frame of mind.

In the military ever since Cain killed Abel, the accent has always been on youth and vigor. Efforts to disregard this dictum are sure to lead to difficulty. The services need young individuals with versatility, adaptability, resiliency and a lot of zing. A plan where older individuals of limited physical ability could staff stateside hospitals and fill the so-called cush billets ashore while the young and agile carry on where the going is grim and gory is shortsighted and unrealistic. This would constitute something of a paradox. Under such a system those deserving an award would have levied upon them a double penalty through a denial of a desirable duty assignment on the one hand and restriction to arduous and hazardous duty on the other.

The services need individuals who are all season and all weather performers capable of carrying the ball under all circumstances and of rotating from sea to shore or from shore to the theatre of combat. Adherence to that practice is essential to the maintenance of good morale in the service.

Particular emphasis is placed upon this point in view of a recent tendency to spotlight an older age group which has seen little or no actual military service, albeit in many instances due to no fault of its own. To force middle-aged and inexperienced doctors into the military service would be certain to introduce complicating features that would be embarrassing to both the service and the individual. This objection could be eliminated through appropriate language in the law. Nevertheless as long as a draft law might be in effect there would always be the temptation or even invitation to overextend its application.

There is another fundamental fault with the draft system as it has been operated. The currently required two-year period of service is too short and forces frequent moves and a consequent reduction in the doctor's actual on-the-job time—a major objection to the individual serving and to those who must manipulate their forces to meet the medical demands which confront them. A two and-one half or three year period would be much better than two. Thus it would be possible to realize two years of effective service from an inductee. Now six months to one year may be absorbed in orientation procedures and transfer to and from a foreign station.

To avoid the evils of short hitches the Bureau of Medicine and Surgery of the Navy has recently introduced a proposal for a short term four year regular commission under which the doctor would be guaranteed his release at the end of four years. He may be offered the option of remaining for three additional years in return for residency training and other premiums. This kind of

provision would, moreover, eliminate probably the most major objection against volunteering for the service, *i e*, a native rebellion against being locked up or fenced in. A similar system is presently in operation in Great Britain's Royal Navy. This system was recently placed in effect in the U S Navy. The response to date has been disappointing.

While it has been emphasized that youthful vigor and stamina are essential attributes to a successful and profitable service with the Armed Forces, sight should never be lost of the fact that any attempt to operate a service medical department by relying solely upon a *modus operandi* of short-term rotation of doctors from civilian life to service and back again to civilian life would be doomed to failure. The maintenance of a substantial basic structure of regular career officers is indispensable to the implementation of the system that has satisfactorily stood the test of time.

During the past several years military medical administrators have heard a great deal about what is wrong with them, their management methods and their organizations. It is generally agreed in the services that disproportionate emphasis has been placed upon certain activities and practices of service medicine. Whether the administrative heads of the Armed Services' medical departments have demonstrated their ability to manage efficiently and effectively is debatable, but these service administrators must think that they have not done too badly. They are mindful and appreciative of the role played by their civilian components, consultants and technical advisers, and their Reserve cohorts in the attainment of their excellent record. However, in the last analysis they consider themselves professionals and singularly capable of judging in many areas where only years of experience could qualify one to judge. These military medical administrators will admit a great wastage of medical manpower during the late war, as there was of every other resource, but they will not admit that it was altogether their fault. They contend that quality and competence are usually reckoned in terms of certain more or less conventional criteria regardless of whether it is an organization or a race horse that is being judged. As with a race horse, one important criterion is performance. The record speaks well of the performance of their respective organizations.

These medical administrators agree that it is possible to look forward intelligently only if one looks backward too. The advantages of hindsight over foresight are well appreciated. The backward viewing critics should not forget that while many instances may be cited in which much energy and resources went for naught in the past, nevertheless those responsible for such expenditure could well have been regarded as negligent had they not made provision for which they were later criticized. A classical

illustration during World War II was the provision of a naval hospital at Netley in England. As it ultimately turned out maybe this hospital was never critically needed. Between June and September of 1944 8 076 patients of which 4 929 were battle casualties were admitted and treated there. For this service the hospital known as Navy Base Hospital No. 12 received a Navy Unit Citation and Commendation. If instead of a success the Normandy invasion had developed into a stalemate with many times the casualties and no provisions for handling the casualties had been made in advance it is probable that adverse criticism would have resulted and very likely from the same sources from which criticism of wastefulness emanated.

Hope in the minds of medical military planners of their ever realizing a satisfactory solution to their personnel problems through simple negotiation and mutual give and take on the part of existing agencies is rather forlorn. It behooves them to look for new means or devices. The question narrows itself down to a choice between two alternatives: (1) the adoption of a scholarship plan; (2) the establishment of a Government-supported school.

The less desirable of these possibilities according to most doctors is a service medical school. During the past several years this matter has been aired upon a number of occasions. Congressman Louis B. Heller of New York in fact introduced a bill in the 81st and 82nd Congresses and reintroduced a similar bill in the 83rd Congress proposing the establishment of a Federal medical and dental school.

While there may be a few doctors in the service who would advocate establishment of such a school it is believed that the majority of service doctors would oppose it. Their opposition would be based first upon their aversion to socialized medicine. It would be contended that such a school would be a gigantic step in the direction of the socialization of all medical establishments and medical care throughout the Nation. Whether this is true or not is debatable. There is little question that the school would be an expensive method of obtaining service physicians and dentists. This idea may be founded upon bases more apparent than real. The continuing need for the school's operation and supply of doctors is another matter about which serious doubt exists. If a plan that could be turned on and off or slowed down and speeded up to meet the exigencies of a given period is desired that would argue against a school.

On the other side of the ledger there are a number of arguments that can be advanced to support the idea of a school. The establishment of a service medical school would eliminate the need for the doctors' draft law. A school or schools for training service physicians, dentists, nurses, et cetera would eliminate the

necessity of the medical services' having to account to various extra service agencies for the manner in which their personnel are utilized

The ratio of medical department personnel to troop strength is established by law. According to Public Law 381, 80th Congress, the Navy is allowed six and one half doctors per thousand, two dentists per thousand, and six nurses per thousand, but insofar as these three corps are concerned, the legal limit has never been reached, even in time of war.

Currently the ratio of physicians per thousand in the Navy is 4.0. This ratio during the past six years has varied between 6.1 and 3.9, with an average of 5.1. The number of physicians necessary to meet the Navy's need is determined by individual activity analysis of medical department workload by representatives of the medical department together with Line officers of the Bureau of Naval Personnel and the Office of the Chief of Naval Operations. This figure is based upon careful and considered planning and is by no means a trumped up quantity.

There are several principles to the much mulled over ratio that cannot be overemphasized. The first is that a ratio is unrealistic for determination of need. To set a ratio and say that the medical services of the Armed Forces must live with it is equivalent to saying that requirements should be determined by guess rather than by computation. To estimate the crew allowance for airplanes on the basis of a ratio per total number of planes would result in a ridiculously haphazard manning of planes. The only realistic attitude that may be assumed relative to a ratio is first to determine a need by a conventional and rational process. From that need a ratio may be deduced. Then a ratio is what it should be—a statistic—an end result and not a determinant.

Another point about ratios that has been contested time and again is that what may be an adequate ratio for the Army generally is not adequate for the Navy. The Navy, operating in a wider variety of media and staffing a greater number of small units, including ships of course, is consequently more broken up and therefore may require more doctors per given number of troops than would be the case if that same number were a part of an Army division. To apply a common denominator and expect the same ratio to be applicable to all the services alike is to deal theoretically with a situation which requires practical treatment.

Furthermore, ratios do not remain constant, but fluctuate from month to month, depending upon personnel turnover, in one determining area or the other, *i. e.* on the medical or troop side of the ledger.

The term "troop strength" is frequently interpreted literally when its implication is distinctly liberal. To be explicit troop strength as envisioned by Congress, includes

the total authorized number of commissioned officers of the Navy and Marine Corps (including commissioned warrant officers) the total authorized number of enlisted men of the Navy and Marine Corps the total authorized number of midshipmen at the Naval Academy the actual number of commissioned warrant officers and warrant officers on the active list of the Navy and Marine Corps and the actual number of midshipmen on active duty for flight training.

Many believe that a Government-sponsored medical school would create a caste or class distinction among doctors. Those trained by the service school would, according to the views of some, have a stilted attitude and a similar brand of medical education. On that basis the advantages which are thought to stem from a mixture of types, a mingling of ideas, and a variety of teachers, and which are realized by drawing doctors into the military service from widely distributed medical schools, would be lost under a military or naval medical academy system.

Would the products of a Government-operated school be a sort of hackneyed, stereotyped, or provincially educated group? While the idea is narrow in its nature, the possibility could be eliminated by special courses in civilian schools. Also, whatever benefits are supposed to accrue from this mixture of finished product from hither and yon will still be realizable, since the men and women who receive their medical, dental, or nurse training in Government institutions or under Government subsidy will have had their academic training in a variety of widely separated schools. The continued admission into the services of acceptable graduates from the medical schools of the nation at large would provide in great measure the highly desirable hybrid vigor that is sought and expected from cross pollination or transfusion of ideas and philosophies.

To refute those who would look askance at the Government controlling what it subsidizes, the advocates of a school can contend that Government control is better than no control. There is little indication that organized civilian medicine has any appreciable control of its members. The question also may be asked: What is so bad about Government control? This question may be supported by the enjoinder to witness the Post Office system. Although that system is not perfect, certainly its performance is quite creditable. Has anyone ever witnessed a walk out or strike or foot dragging on the part of its employees? Whenever a national institution or service under the control of a special civilian element is unable to supply an essential need, what is more natural than for the people to turn to their Government for a correction of the situation? The Government did take

over and deliver the goods when it enacted and reenacted the doctors' draft law

The creation of a medical West Point or Annapolis, or a combination of the two, could bring an end to the recurring contention that the services are ruthless in their drain upon civilian medical personnel and that as a result of service extravagance the civilian population suffers

There are two schools of thought about whether the existing facilities are turning out an adequate number of physicians and dentists to meet civilian and military needs. Based upon the commotion in some localities after the application of Public Law 779, one cannot escape the impression that doctors are in distinctly short supply in many areas and are nonexistent in others. Whether or not the output is sufficient, it is a rather weak argument to explain the apparent shortage of terms in a maldistribution of doctors. That may be an explanation but it is not a justification. Some good candidates for admission to medical schools are denied the privilege of studying medicine because of the Nation's limited training facilities. The creation of a government school would allow many of these young men and women to study medicine. That school could feed into the civilian economy a number of well and specially trained doctors.

A government school as a source of doctor supply would stop debate about the extent that the military should provide medical coverage for dependents of its personnel. If the Armed Services are not accused of depriving civilian communities of badly needed doctors, and in turn using these doctors to treat dependents of service personnel, a score about which there has been much "to-do" will be settled.

If curtailment, or even abolition, of dependent care would eliminate the need for a doctors' draft law, the services would agree that dependent care reduction or even abandonment of dependent care might be justified. But the idea that this would be possible is argued by no one, because the total number of doctors employed in the care of dependents is not great enough to make the difference. The Navy takes care of its dependents in accordance with a clear cut existing law. There is nothing "phony" about it. It is moreover plainly implied in the deliberations of the various committees, including Congressional committees, which have studied formulation of an equitable pay scale for the services, that dependent care by service doctors at a special rate of charge would be continued. The latest expression of opinion upon this score was reflected in no uncertain terms in a report submitted in June 1953, by a Citizens Advisory Commission to study medical care for dependents of military personnel appointed by the Secretary of Defense with Dr. Harold G.

Moulton President Emeritus of Brookings Institution as chairman Inpatient care is not free to those eligible The Navy has no choice except to abide by the law It is a Medical Department axiom that no form of medical care is as good as it should be if it is not as good as it can be

Even with the medical coverage currently provided to dependents a high percentage of the enlisted personnel whose dependents require hospitalization seek aid from the Navy Relief Society to defray expenses That the services should take care of their own people appears to be no more than natural and desirable As a class service dependents are a worthy and courageous lot They are frequently called upon to endure hardships and anxieties of a most trying character peculiar to service life in peace as well as in war Those upon whom they depend are engaged in the all important mission of protecting America from forces that would destroy her For that service their remuneration is modest indeed There is no condition or circumstance more contributory to the morale of Armed Service personnel during their absence from home than the knowledge that their dependents will receive adequate medical care

The morale factor inherent in dependent care and upon which so much stress is laid is not confined to the dependents and to those depended upon but also extends to the doctors providing the care The majority of doctors engaged in the practice of obstetrics and gynecology or of pediatrics in the services are happy and restricting or discontinuing such care would be as detrimental to the morale of that category of doctors as to those in need of their services

It should be borne in mind that no objection has been raised about service provided care to dependents at overseas bases and isolated stations To be able to provide an acceptable quality of dependent care overseas the military contends that the doctors providing that care must be specialists In order for them to remain competent and contented the practice of their specialty must not be restricted to overseas and foreign stations

An independent source for doctor supply it can be held should go a long way towards eliminating the seemingly endless number of inquiries investigations and analyses to which the medical departments of the Armed Services have been subjected during the past seven or eight years This period has literally been one in which the Monday morning quarterbacks the reformers and the so-called curious crusaders have had a real heyday in Washington For a considerable period these investigations were welcomed because it was felt that they would be helpful and while the services were proud of their organizations and were glad for outsiders to become better acquainted with

them and were glad of their opportunity to become better acquainted with outsiders, these investigations have continued to require the expenditure of an appalling number of man hours and the documentation of much testimony and statistical data. It will not be denied that appreciable benefit has accrued from some of these surveys. By a similar token, there have been a number in which the good that came of them was never apparent.

Some corrections held to be realizable through a school would be similarly realizable by the adoption of a scholarship plan. Under either plan the services would be provided with properly motivated medical and dental officers. Proper motivation is a factor which it is impossible to exaggerate. The service doctor needs to be of a special breed. Service medicine is a specialty *sui generis*. A doctor specifically trained for the service would scarcely complain about inspecting latrines, or mess gear sterilizing apparatus, or running milk analyses. These are logical views. The service doctor must be an inordinately versatile and adaptable individual. If one is unable or unwilling to comply with the requirements peculiar to the service, he may be compared to a baseball player who is extremely proficient as a batter and a runner, but cannot field and throw the ball. His value is reduced fifty percent. He does not qualify for the team.

Like the school idea, the scholarship idea for supplying Navy doctors is not new either. In 1948, a Navy formulated plan was presented to the Association of American Medical Colleges before its annual meeting at White Sulphur Springs, West Virginia. The salient features of this plan were:

- 1 Scholarships would be provided by contracts with accredited educational institutions offering approved undergraduate courses in medical or dental science.

- 2 All educational expenses were to have been paid plus \$75.00 per month as a retainer fee to each beneficiary.

- 3 The plan called for obligated service on the basis of one year of active duty for each year of scholastic training at Government expense.

- 4 No scholarship graduate was to have been eligible for residency or specialty training until he had completed an appointment in the regular service unless he agreed to extend his period of obligated service by the amount of time spent in residency or specialty training.

This plan was received by the members of the Executive Committee of the A. A. M. C. with sufficient interest to prompt its submittal by the Committee to the deans of all the medical schools in the country. They were requested to express their reaction to the proposal and indicate how many additional medical

students their facilities might be stretched to accommodate. The reception to this plan throughout the country ranged all the way from enthusiasm to complete indifference. The over all response can be said to have been little more than cool. Inadequacies of one kind or another including lack of laboratory space and clinical material, were claimed in most cases. In any event steps were taken to obtain legislation to carry out this plan. The bill died in committee.

Following the Navy's lack of success in its scholarship ventures the Army formulated a scholarship plan. Theirs differed from the Navy's chiefly in the amount of dollar benefit the medical schools would realize through it. This plan is still a live issue and will probably reach the Congress at some future date.

There are many points in favor of a scholarship plan as a system of medical and dental officer procurement. It would carry with it the expressly desirable quality of providing for undergraduate training in already existing medical schools. It would preserve intact the advantage that accrues from an intermingling of the ideas and teaching methods of a variety of institutions. It would further a close relationship between civilian and service medicine and maintain a state of awareness among civilians that the interests of the Armed Services are their interests. Most important of all in the estimation of some it would pre-empt the creation of a government-sponsored and operated medical school.

The scholarship plan even in the most expensive form yet considered would be much more economical than establishing a school. This estimate will be challenged when the question of school versus scholarship reaches the arena of debate and is subjected to the analytical scrutiny of experts. Undoubtedly some will advance the view that the validity of the economy contention is subject to various elements of reasoning. First, whether a long range or short-range program is envisioned would make a difference. The longer the life of the school for instance the more would the balance be tipped in its favor since its initial cost would be a major budgetary item. Secondly, whether the contemplated school would supply physicians and dentists to the Armed Services only or if as in the Heller Bill referred to earlier in this treatise the school would train physicians and dentists for the other Federal Services requiring medical men certainly would be significant. The broader the purpose of the school the more readily might it be justified dollarwise but by a similar token it would be more criticized on grounds of socialization. Of course if a scholarship system is adopted for medical and dental officers other Federal agencies such as the Public Health Service, the Indian Service and the Veterans Administration might seek to be included in the program. Thus the economic

factor of the school is given a decided boost, but, on the other hand an extension of the scholarship program to include the training of doctors for all Federal Agencies would introduce a situation in league with socialized medicine. Still another facet is involved. Would the administrators of the nation's medical schools remain insusceptible to temptation? It may be perfectly true that it would cost less to subsidize medical education of students than to create and staff a medical school, but the tendency would be present for the medical schools to become more and more receptive, if not solicitous, of Government aid, until the Government could be subsidizing 70 medical schools rather than one. While organized civilian medicine and medical schools may regard Government subsidy as a vice to be abhorred, there is always the possibility that such a vice may ultimately come to be embraced. A significant advantage with a scholarship plan would be that it could be turned on and off to meet the needs of the services depending upon expansion and contraction, and upon the popular appeal of the services as determined by the civilian economy.

It has been found from actual experience that the needs of the Navy can be best met if two thirds of the Medical Corps are members of the Regular Navy and one third are Reserves. Currently, this ratio is exactly reversed. As of July 31, 1953 there were 5,854 doctors in the Medical Corps of the Army, 4,202 in the Navy and 3,452 in the Air Force for a total of 13,508. The number of regular medical officers now serving in the military departments is 3,951. The services therefore fall more than 5,000 officers short of the two thirds ratio. If present methods of procurement are sufficient to provide for normal attrition, which is estimated at six percent per year, a long range plan to procure more than 5,000 medical officers and thereby maintain a combined regular corps for the three services of 9,333 is necessary. To avoid a bump in promotion and permit readjustments to possible future changes in overall strength, it is desirable that officers be brought into the regular service over a period of from five to ten years. If the shortage is to be made up during a period of five years an enrollment of about 1,100 medical officers per year is required. This represents an average of 16 graduates from each medical school per year. If the shortage is to be made up during a ten year period about 550 officers per year would be required. This would call for eight graduates per school per year. This would have to come from the civilian economy unless eight scholarship-subsidized graduates could be provided by each existing medical school annually under an existing scholarship plan.

It should be emphasized that after the Medical Corps has been brought to full strength, an annual input of eight officers from

each school will be necessary if the annual attrition rate continues at approximately six percent. This would be approximately eight percent of the annual crop of medical school graduates. It is possible that the attrition rate could be counteracted by the number of non-scholarship trained doctors who might elect to enter the military services. In any event the restoration of the erstwhile ratio of two thirds Regulars to one third Reserves would with specific reference to the Navy at least be desirable. Civilian medical agents or agencies can accomplish little that would be more helpful than to effect the acceptance of a military medical career by an increased number of doctors.

Objections that may be advanced against a scholarship plan would include opposition to the Government's gaining control through subsidy. The same hypothetical reply that has been suggested concerning the school's potentiality would apply to the scholarship: *i. e.* government control is better than no control. There might be differences of opinion as to who would choose candidates for medical training under the scholarship plan. That should not be a major obstacle. It would seem logical that insofar as the intellectual qualities of candidates are concerned the medical school officials should be the sole judges but for physical qualifications and an estimate of proper motivation and service aptitude. Armed Forces representatives would be better qualified to judge.

For a long time there has been a sort of barrier between service and civilian medical devotees. This came about more or less through a natural set of circumstances and while it did not appear to make much difference the situation nevertheless has been short of being as healthy as is desired. Since the advent of new methods and new concepts of warfare which promise to involve civilian populations in future conflicts directly, there has been a closer intermingling of civilian and service doctors. While there is no question that this barrier has been lowered through the instrumentality of a common cause it has not been abolished entirely.

Possibly this insouciant attitude towards the services goes directly back to the medical schools (some of which appear to be frozen in the ice of their own self-sufficiency or their material limitation of facilities) and to the influence of certain individuals who are not sympathetic with Emerson that. Our culture must not omit the arming of the man. One unsympathetic professor can do more to instill misgivings into the minds of young doctors than all of the friendly gestures possible on the part of the military can offset. For a military scholarship system to operate satisfactorily service trainees must be accepted on an identical basis and subject to the same attitude as are all other students.

The establishment of a scholarship system should bring service and civilian medicine closer together and make for a warmly cordial rapport. Resort to a government school could accentuate two factions between which a barrier might be raised. It seems reasonable to hope and expect that a mutually beneficial relationship between the nation's medical schools and the Armed Services will accrue through the Medical Education for National Defense or MEND program. MEND pilot programs are currently in force at five of our leading medical schools.

With the help and guidance of the representatives of organized civilian medicine and dentistry, combined with the legislative support the Armed Services have been wont to receive from Congress in the past, it is believed that a sensible and realistic approach to the personnel problems that confront the medical departments is possible. Through such cooperation, a satisfactory solution must be amicably and expeditiously realized.

The burden of the theme of this offering has been that due account be taken of a priceless resource particularly as pertains to the provision of professional personnel requisite to its preservation and restoration. That the time is high for forthright and conclusive action has been stressed. The advantages and disadvantages inherent in possible courses of action have been outlined.

The health of our military men and women is all important. Trained doctors in adequate numbers to protect service personnel from illness and injury and to treat these entities when they arise are necessary. Too few doctors, now, are willing to volunteer for military medical service.

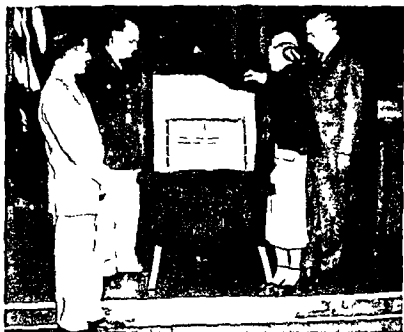
Some adequate solution to this situation must be found soon

Multiple Sclerosis and the Future

I am appalled by the magnitude of the problem of multiple sclerosis and the extent of work yet to be done but when I think of other diseases which medicine has conquered I am not discouraged. We all know that it is now difficult to show medical students examples of many diseases which were once epidemic and ravished whole populations. If we are diligent aware of possibilities and fortunate the day may come when multiple sclerosis is as rare.

—HAROLD R. WAINERDI, M.D.
*in Medical Annals of the District of
Columbia* p. 14 Jan. 1954

Plaque Presented to Medical Center in Honor of Late Col Holloran



Dr Winfred Overholser right Superintendent of St. Elizabeth's Hospital Washington D C. is shown in recent ceremonies at Walter Reed Army Medical Center unveiling a bronze plaque in honor of the late Colonel Roy D Halloran MC USA in the presence of Major General Leonard D Heaton MC USA Commanding General of the Center and Colonel Halloran's son Donald Washington and daughter Mrs Franklin Navarro Houston Tex

The plaque which was the gift of the American Psychiatric Association bears the inscription as a result of his unceasing efforts psychiatry gained a status equal to that of medicine and surgery in the United States Army Medical Service Colonel Halloran was chief of psychiatry in the Office of the Surgeon General U S Army during World War II He died on 10 November 1943

At the same ceremony Major General George E Armstrong Surgeon General of the Army posthumously awarded the Certificate of Achievement to Colonel Halloran

THE MEDICAL ESTIMATE

SPURGEON H NEEL *Lieutenant Colonel MC USA*

EVERY medical officer, whether he supervises the medical service of an infantry battalion or that of a theater of operations, must make an intelligent estimate of the military and medical situation before he can select the best course of action in support of his commander's mission. There is no difference in the principles involved in planning good medical service for a small unit in the zone of interior than in developing the medical plan for a major command in contact with the enemy. The only differences are the detail involved and the manner in which the estimate is used. Good medical service must be planned and based on sound estimates. There is no alternative.

The estimate of the situation may be defined as a logical and orderly examination of all of the factors affecting the accomplishment of the mission to determine the most suitable course of action. The outline for the commander's estimate of the situation has been standardized by the Joint Chiefs of Staff for use by all components of the armed services. Its purpose is to provide an orderly arrangement of the material contained therein to minimize the possibility of omitting matters of importance, and is designed to facilitate straight and clear thinking in arriving at a sound decision.

THE OUTLINE

The outline for the medical estimate as presented in this article is developed from the same sources of information used for the commander's estimate, and its standards parallel the latter in clearness and brevity. There is, however, no standard outline prescribed for the medical estimate as there is in the case of the commander's estimate of the situation. Therefore the recommended outline (form 1) follows both the commander's and the logistic estimate, and facilitates concurrent preparation. It is used in instruction at this school, and has served as an effective check list when considering the various factors affecting field medical service.

An estimate is an intensely personal matter and each surgeon goes about it in a slightly different way. The recommended out-

line is not intended to regiment or complicate the thought processes of individual surgeons and it gives more details than the average surgeon will have time or need to consider. A running estimate of the situation revised as events transpire, is the rule in the field. It must always be remembered that the formal estimate is a means not an end, and that a logical course of action must never be sacrificed in favor of a proscribed course of action.

**Form 1 Outline of the medical estimate
(CLASSIFICATION)**

Med Sec. _____

Location _____

Date and time _____

- 1 MISSION (the specific medical support mission)
- 2 SITUATION AND CONSIDERATIONS (factors affecting medical service)
 - a Characteristics of the area of operations

(1) Terrain	(4) Flora and fauna
(2) Climate and weather	(5) Local resources
(3) Civilian population	
 - b Enemy situation

(1) Strength and disposition	(4) State of logistics
(2) Combat efficiency	(5) State of health
(3) Capabilities	(6) Weapons
 - c Friendly situation

(1) Strength and dispositions	(4) State of logistics
(2) Combat efficiency	(5) Weapons
(3) Plan of action	
 - d. Strengths to be supported (normally a table)

(1) Army	(5) Prisoners of war
(2) Navy	(6) Civilians
(3) Air Force	(7) Others including
(4) Allied	partisans
 - e Physical condition of the command

(1) Origin of troop	(5) Clothing and equipment
(2) Presence of disease	(6) Fatigue
(3) Status of immunizations	(7) Morale
(4) Status of nutrition	(8) Other as indicated
 - f Assumptions (those necessary for completing the estimate)
 - g Special factors (item of special importance in the particular operation under consideration)

3 MEDICAL ANALYSIS

- a Casualty estimates (rates and numbers by type units)
 - (1) Number of casualties
 - (2) Distribution in time
 - (3) Distribution in space
 - (4) Areas of casualty density
 - (5) Lines of drift or evacuation
- b Medical requirements (estimate of requirements)
 - (1) Medical supply
 - (2) Hospitalization
 - (3) Evacuation
 - (4) Service
 - (5) Preventive medicine
 - (6) Other
- c Medical means available
 - (1) Organic medical units
 - (2) Attached medical units
 - (3) Supporting medical units
 - (4) Civil public health
 - (5) POW medical personnel
 - (6) The medical troops ceiling
- d. Medical courses of action (list of policies and procedures which will accomplish the medical mission)

4 MEDICAL EVALUATION

- a Outstanding medical elements and controlling limiting features
- b Comparison of relative advantages and disadvantages of each medical course of action available

5 CONCLUSIONS

- a Can the commander's mission be supported medically?
- b Which course of action will best and most economically support the commander's mission?
- c What major medical features should be brought to the attention of the commander?
- d. Outline unavoidable medical limitations or deficiencies

Surgeon

(CLASSIFICATION)

NOTE: When the commander is conducting a plan, the medical estimate may be carried forward in parallel with the combat estimate. The medical estimate will be developed with the rest of the mission plan. It is not a separate document.

MISSION

Broadly speaking, the mission of all medical units is to provide medical service to the troops which they support. The mission of the tactical commander determines the medical requirements to be met by the medical service and the procedures by

which these requirements will best be satisfied. A clear statement of the type of tactical operation to be supported must be included such as "To render medical support to the Infantry Division in an assault on a fortified position." If several categories of personnel are to receive varying types or degrees of medical service such should be mentioned in the concise statement of the medical mission.

SITUATION AND CONSIDERATIONS

Characteristics of the area Various items of medical intelligence affecting the medical service of the particular operation are enumerated. An estimate is only as good as the information on which it is based and the surgeon must exhaust every potential information source as far as time and circumstances will permit.

For example, terrain has the same bearing on medical planning as it does on tactical planning and directly influences the incidence and location of casualties. The availability of roads, landing strips, railroads, and harbors will influence the type of evacuation planned. Whenever possible, the surgeon or his representative should make a personal reconnaissance over the terrain on which the battle will be fought.

Climate and weather also contribute to the incidence of casualties. Frostbite, snow blindness, trench foot, sunburn, or heat exhaustion all affect the requirements for medical facilities and means of evacuation. The speed at which drugs and medical equipment deteriorate is related to climatic conditions and storage facilities must be estimated accordingly.

Civilian sources may spread disease to the command, and medical assistance requirements for civil affairs and military government operations must be anticipated; therefore a consideration of the methods and organization of local public health agencies is important.

Because insects, animals, and vegetation may possibly affect the health of the command, troops must be oriented and other safeguards taken against these agents. Insects can be particularly troublesome and detailed information regarding their types, numbers, distribution, habits, et cetera is essential.

Local resources, especially food and water, are of importance to the surgeon. While other agencies are responsible for procurement, the sanitary supervision of food and water from sources to consumers is the responsibility of the medical service. The availability of acceptable medical supplies within the area may permit a reduction in medical supply procurement requirements.

Enemy situation The surgeon is particularly interested in the enemy's ability to cause casualties and to prevent their evacuation. The presence of contagious disease among the enemy may serve as a source of infection for friendly troops and necessitate special immunizations or other precautions.

Friendly situation The relative combat power of friendly and enemy forces and the plan of action, as well as initial and ultimate disposition of troops, determine the tactical location of supporting medical units.

Strengths to be supported The strengths to be supported medically must be ascertained as early as possible. Normally, a table is prepared dividing the supported troop strengths into categories indicating the types and degrees of medical support each will require. These tabulated strengths are the bases against which various experience factors can be applied. Civilian and prisoner of war estimates are often included.

Physical condition of the command A consideration of the many factors affecting the physical condition of the command will aid in determining medical measures taken prior to and during the operation, and may modify casualty estimates. Many of the factors considered require command attention, but are of interest to the surgeon as the medical advisor to the commander.

Assumptions and special factors Action based on assumptions is normally restricted to higher levels of command, and such assumptions usually apply only to those factors beyond the control of friendly forces, such as enemy capabilities, weather, et cetera, but the medical officer must also consider the possible effects of such factors when making his estimate. Special factors are those not listed elsewhere, or items of such importance to the particular operation as to merit separate consideration.

MEDICAL ANALYSIS

Casualty estimates The medical analysis is a logical comparison of estimated medical requirements with the medical means available for the operation. Casualty estimates, including numbers distribution in time and space, areas of casualty density, and lines of drift or evacuation, must be calculated from the data accumulated. Experience tables, such as those contained in FM 101-10, are of value to the surgeon until such time as his own experience or the published experience of his particular theater provide sound calculations.

Medical requirements These are calculated from available data and should be considered separately. Such items as medical supply, evacuation, hospitalization, transportation (to include additional transportation necessary for evacuation and move-

ment of medical units and supplies) service, preventive medicine and any others which may be indicated, should be considered

Medical means available The medical troops ceiling must be considered in commands the size of field army and larger. Because it takes time to secure additional medical units, their requirement and availability must be considered as early as possible. Certain limitations are placed on the use of civilian and enemy medical personnel and supplies but they may be advantageously used in caring for their own casualties.

Medical courses of action From a consideration of medical requirements versus means the surgeon determines his major problems, and develops general courses of action which reconcile these two elements and provide proper medical support for the operation. In comparing several medical courses of action the surgeon considers such matters as centralization versus decentralization of control, dependence upon evacuation by other military components, extent to which civilian and prisoner of war labor will be used, evacuation policies, et cetera.

MEDICAL EVALUATION

In evaluating the courses of action previously considered, the first step is a listing of the outstanding medical elements and controlling, limiting features. The courses of action are compared with one another in the light of these major medical elements and the comparative advantages and disadvantages are listed.

CONCLUSIONS

In the final step of the estimate the surgeon arrives at his conclusions which form the basis for the development of the medical plan. Due to the surgeon's position as a special staff officer the term "conclusions" is deemed more appropriate than the word "decision." The surgeon's conclusions provide the commander with a statement of whether or not the operation as envisaged can be supported medically. If not a clear concise outline of the reasons must be included. In such rare cases the commander will normally consider other courses of action before announcing his decision. The surgeon also includes a general statement of the course of action that best and most economically supports the commander's mission. The economic factor is introduced because any operation is but one of several to be supported in succession; therefore medical economy, while secondary to medical efficiency, is of extreme importance both to the surgeon and to his commander.

Occasionally, even when the operation can be supported, some particular medical element should be brought to the commander's attention. This is necessary to secure his personal indorsement of requests made to higher headquarters for additional medical means, or to insure that he is aware far in advance of some unavoidable medical limitation.

Lastly, the surgeon's conclusions outline the unavoidable limitations and defects which must be recognized by everyone associated with the medical service of the command. Such a listing will insure the co-ordinated effort of all concerned in reducing the effects of such limitations.

SUMMARY AND CONCLUSIONS

The medical estimate is not an isolated, separate, cumbersome administrative burden thrust upon the surgeon. It is, rather, an integral part of the process by which good medical support is evolved, and provided to the command. The procedure advocated does not require an inordinate amount of time, but operates as a timesaver for the surgeon in the field. It has been said that "It is not what the logistic planner does that takes all his time, but what he has to do over." A sound estimate of the situation will preclude "doing things over" and will eliminate costly confusion and duplication of effort.

The recommended outline for the medical estimate assists in a logical, orderly consideration of all the factors affecting the accomplishment of the medical mission of the command. It guides the novice through all the steps essential to forming a sound medical estimate, and it provides the experienced field surgeon with a valuable check list designed to conserve time and avoid costly errors of omission. The ultimate contribution of a sound medical estimate is the creating of a realistic medical plan which will combine the maximum medical service support with the utmost medical economy.

The chronic neurotic is one of the most time-consuming cases of all. To my mind early treatment of neurotics is medically and socially profitable and it is well worth taking stock to see what early and adequate treatment can be given.

—R F TREDGOLD M D
in *Lancet* p 411 Aug 29 1953

PROFESSIONAL INTEGRITY AND RESPONSIBILITY

JACK M. MESSNER C I I USAF (DC)

THE Dental Surgeons Course which you have completed is one of the most comprehensive administrative courses that has ever been made available to a dental officer. You have received instruction in the technical know how necessary for the administration and operation of nearly every type of dental activity. Your lectures embodied the subjects that concern all commanders and are the administrative procedures necessary for the operation of separate dental organizations.

Whether you are a dental surgeon without command responsibility or commander of a dental squadron with full command responsibility your success is not in any way assured or guaranteed because you have successfully completed this course. The subject not included in this course, but which is most essential to your future success is one that can't be acquired from lectures. What seems to be a lack of it may often mean only that it has not been developed or given a chance to show itself. I refer to those attributes of leadership that characterize us with dynamic or active qualities: integrity of character, and a willingness to accept responsibility.

Being dynamic means striving always to drive ahead, to break new trails, to engage in new ventures to discover new things to move into the unknown. It is a desire for change, an urge to stay ahead and to do better more ambitious things. It is a wish for growth and an abiding fear of stagnation and it is revealed in an urge to accomplish. Unless the dental surgeon also has an urge to forge ahead and do new things, he is simply maintaining the *status quo*. In the end he will probably administer his organization right into the ground. Governments and institutions are the great gathering places for this passive administrator. His eye is on a pension, not on real progress. Closely akin to this individual is another, the man who would sacrifice the principles

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P ed gr dua i W R d Ba De I Surg Comd Gun
B b U S A F c School I A Med G A F Ba Al
5 Fbruary 1954

character a highly motivated conscience. You must have unshakable self respect, resolution and both moral and physical courage. Integrity of character is that quality which compels you to perform the more difficult task when you know it to be the right one—that quality which forces you to be selfless instead of selfish. Theodore Roosevelt once said, "Far better it is to dare mighty things, to win glorious triumphs even though checkered by failure, than to take rank with those poor spirits who neither enjoy much nor suffer much because they live in the gray twilight that knows neither victory nor defeat."

In addition to your integrity of character and your technical knowledge, you must have a keen sense of responsibility. I ask you not just to be satisfied to accept responsibility—go look for it—seek it out—and when you have found it you will accept it with certain emotions that give you the courage to stick your neck out—to act contrary to all advice when conscience demands it—and to take full blame when all goes wrong.

I now close with the suggestion that you devote some thought to this subject. To achieve success, you must continually strengthen and reaffirm your integrity of character, your sense of responsibility, and those dynamic qualities which you do possess.

Relief from Pain

In this day when we are placing so much emphasis on silent pathology it would not seem necessary to issue an additional warning. Because of certain observed cases I feel that this must be done. It is the warning that in relieving pain only a symptom has been removed. The ease of elimination of this symptom does not relieve the physician of the responsibility of following through the necessary steps for adequate diagnosis of the underlying disease. It is important that this be done regardless of the wishes of the patient who frequently believes that once he feels better nothing more is necessary. Cases of bronchogenic carcinoma, tuberculosis and other diseases of the chest have been found in patients who submitted to roentgenographic examination and work-up only on the insistence of the physician despite their own statement that they felt perfectly well and needed no additional treatment.

—EDWIN RAYNER LEVINE, M.D.

D e of the Ch st p 532 Nov 1953

OFFICER INDOCTRINATION IN PREVENTIVE MEDICINE

The Air Force Plan

NORMAN S. TALNER *First Lieutenant USAF (MC)*

JOHN RIZZOLO *Lieutenant Colonel, USAF (MC)*

HUGH W. RANDEL *Major USAF (MC)*

IN military medicine emphasis must be placed on the prevention of disease and injury as well as on the provision of medical care for patients in hospitals. This principle is well known to all experienced military physicians and to informed line officers. Emphasizing this point, Kern¹ recently stated: "Military medicine is the application of sound medical principles to the prevention and management of injury and disease under the conditions imposed by war."

MILITARY NEED FOR PREVENTIVE MEDICINE

The preservation of fighting strength has been the major role of military medicine in the past. Notwithstanding modern advances in medical procedures and method, this fundamental objective has remained the same. Innovations, such as the antibiotics, and improved immunizations have not put an end to the need for preventive medicine in military units, but merely serve as valuable tools in accomplishing the task. Experience gained throughout the Korean conflict has re-emphasized the absolute necessity of having a medical service experienced in the prevention of non-effectiveness due to disease and injury. During the early months of the war it was observed that sanitary standards among Air Force personnel in Korea became dangerously low, and the incidence of communicable disease increased alarmingly. The following excerpt illustrates this situation:

"Beginning in July 1950, disease admission rates progressed gradually with a very definite increase noted in December. The greatest increases were in the admission of respiratory and intestinal disease groups. Overcrowded barracks, inadequate heating, poor dishwashing facilities, inexperienced personnel and other factors combined with the inability to isolate respiratory

cases in sick bays caused marked respiratory incidences throughout the command. Likewise, overtaxed messes, shortages in mess equipment and refrigeration, carelessness and hasty food preparation and insufficient attention to routine sanitary precautions led to increased intestinal disease rates with sporadic localized food poisoning outbreaks.

It is an indisputable fact that Air Force personnel have not had sufficient training in living under field conditions and in many cases personal hygiene practices were lax. Nowhere can the deficiencies or omissions apparent in Air Force control of environmental sanitation be pointed up more clearly than through the Korean experience.¹

It should be added that many of these deficiencies occurred among newcomers to the Air Force ranks including Medical Service personnel. Clearly there was a need for preventive medicine minded officers in the Air Force Medical Service.

During mobilization periods the officers of the medical services of the armed services are made up largely of those from civilian practice. These physicians and dentists in civilian life are concerned solely with the diagnosis and treatment of individual patients. By training and practice they are clinicians. For this reason adaptation to military practice by the newly commissioned officer who is assigned to a hospital is relatively easy. In such an assignment he undertakes the care and treatment of military patients in much the same way as he did in civilian life. The amount of indoctrination required to fit such officers for their immediate assignments is minimal.

For those officers assigned to field units or as staff surgeons however, there is greater need for military indoctrination. A basic requirement of this indoctrination is that officers acquire a full appreciation of the concept of military preventive medicine. They must think in terms of the physical fitness and military effectiveness of large groups rather than of individual patients in the hospital. Such reorientation of physicians is not always easy. They tend to focus their attention on the most interesting medical patients in the hospital who are often relatively unimportant from a military standpoint—for example, a difficult endocrine diagnostic problem. On the other hand, common and professionally less interesting conditions such as athlete's foot or scabies are of utmost military importance when they occur in large numbers of troops. Military physicians must recognize that it is the collective effect of a disease that determines its military significance. In evaluating this military significance one must consider not only the hospital admissions and deaths but also man

days lost, disability separations, effect on morale, and the general lowering of unit effectiveness

INDOCTRINATION OF OFFICERS

In a recent article Strickland and Nuernberger¹ outlined the curriculum of the officers indoctrination course for all newly commissioned officers of the Medical Service given at this school. They pointed out that of the total instructional hours, 31 hours are devoted to preventive medicine. The composition of these preventive medicine hours, together with the educational methods used to obtain maximum student comprehension, are described in this article. This large proportion of preventive medicine is considered essential in such an indoctrination course for the following reasons:

1 As has been indicated, the principal basic difference between civilian medical practice and military medicine is the important concept of prevention.

2 In the prevention of disease and injury all officers are involved. Preventive medicine officers are not enough. An effective preventive medicine program requires the enlightened and active participation of all personnel of a command.

3 The goal of instruction is not only to prepare officers for their next duty assignment but to raise the general level of their military effectiveness for any future assignments.

PLAN OF THE COURSE

In the officers indoctrination course, an attempt is made to give newly commissioned officers of the Medical Service an overall picture of the preventive medicine program, emphasizing current problems in terms of military noneffectiveness, and those measures currently in use for the control of these problems.

Each hour is planned to use as much as possible, pertinent audio-visual aids, and to foster active student participation. Four general areas of instruction in the course will be briefly summarized: (1) military epidemiology, (2) environmental sanitation, (3) the preventive medicine staff problem, and (4) preventive medicine records.

MILITARY EPIDEMIOLOGY

Seventeen hours on this subject are devoted entirely to medical considerations and are presented by Medical Corps officers. Students are first oriented in the principles of epidemiology and epidemiological investigation, and then various communicable diseases, including malaria, infectious hepatitis, respiratory

diseases and the intestinal diseases are discussed from the epidemiological viewpoint. Emphasis is placed on the sources, spread and control of communicable disease particularly those now confronting the Air Force. Policies on immunization and international quarantine are considered as both are highly pertinent subjects in a globally deployed force. In addition preventive medicine problems under varying environmental conditions are stressed including salt and water requirements in tropic areas and the adverse effects of cold in arctic regions. In regard to the servicing, maintenance and modification of aircraft and related equipment Air Force operations of necessity include a large amount of industrial activity with attendant industrial medical problems. Many of these problems are common to all industries. A few however such as the toxic effects of aircraft fuels and solvents and the noise problem produced by jet engines are peculiar to this service. These problems and the possible means for their solution are reviewed. The medical aspects of defense against biologic warfare with its various ramifications are covered together with a discussion of the history, possible biologic warfare agents, mode of dissemination, detection devices and current defense measures. This is part of the Air Force's aim to give basic information on the medical aspects of defense against unconventional methods of warfare—atomic, chemical and biologic.

ENVIRONMENTAL SANITATION

These hours of instruction are presented by sanitary engineers and an entomologist. Water purification, waste disposal, food service sanitation and arthropod and rodent control measures are emphasized. Of particular value in this section are three demonstrations: the sanitation demonstration area, the preventive medicine laboratory and a housing inspection. At the sanitation demonstration area the student sees improvised sanitary devices in operation under simulated field conditions (fig. 1). On the tour through the preventive medicine laboratory specimens of vectors and reservoirs of disease are exhibited, various personal protective devices are shown and implements for control are demonstrated (fig. 2). This serves to integrate much of the material presented earlier in the epidemiology lectures because the student, having first been told of a particular disease problem, sees at firsthand the vectors and reservoirs of the disease and the equipment used for its control. In participating in the housing inspection the student officers are performing a function which they may be called on to do at their assigned bases. Principles of a proper housing inspection to discover and correct deficiencies are brought out.

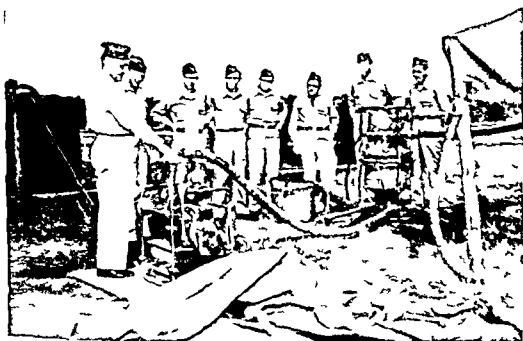


Figure 1 Demonstration of field water purification equipment

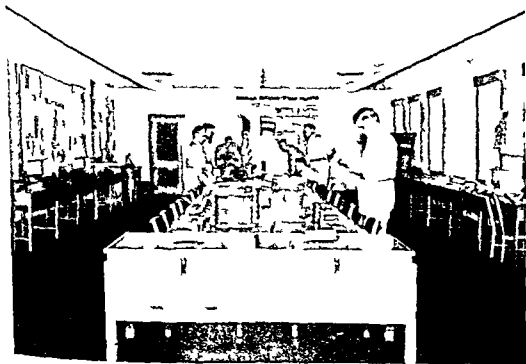


Figure 2 Demonstration of disease vectors and reservoirs, personal protective measures, and field insect and rodent control devices

STAFF PROBLEM

This portion of the preventive medicine instruction is considered to be one of the most important in the course because students are afforded a chance to participate actively in the solution of a preventive medicine field problem. Such a problem might involve the movement of a tactical wing from Japan to Korea in which the student prepares the preventive medicine annex to the over all medical plan and the sanitary order. Practical application is made of the material presented throughout the course. The format of the problem is presented early in the course and the students are divided into groups to work out the solution. Toward the end of the course a seminar is held at which officers of the various corps present their solutions. A physician, sanitary engineer, and entomologist from the preventive medicine staff moderate.

RECORDS AND REPORTS

This portion of instruction is sectionalized for Medical Corps and Medical Service Corps officers who may be called on to complete these records and file the necessary reports. Familiarizing the students with the necessary procedures involved in filling out the forms facilitates their future job assignments. Comprehensive coverage is given to the various preventive medicine reports, immunization records and epidemiological investigation of venereal disease contacts.

SUMMARY

For service indoctrination in the principles of preventive medicine and sanitation, newly commissioned officers of the Medical Service are given a comprehensive course in preventive medicine which includes epidemiology, environmental sanitation, preventive medicine staff problem, and preventive medicine reports and records.

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 - 3 Strickland B. A. and Netherberger R E. *Translational Physiology* A. A. Fox U S Armed Forces Medical Journal 1291-1298 Sep 1953
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THE AIR FORCE RESERVE MEDICAL TRAINING PROGRAM

ARTHUR L. STREETER *Colonel USAF (MC)*

THE Air Force reserve training program, administered by the Continental Air Command located at Mitchel Air Force Base on Long Island, New York, carries out its reserve training functions through four numbered air forces, each covering about one quarter of the population of the United States. In some areas these air forces are subdivided into districts, a procedure which encourages a closer relationship between the individual reservist and the Air Force.

The purpose of this reserve program is to provide trained personnel ready and willing to defend their country on short notice whenever an enemy threatens its safety. To meet this requirement it is necessary to build a varied program which can adapt to the needs of the reservist who can spare only a limited time from his civilian pursuits, yet fulfill the purpose for which it was created. To this end considerable thought and effort have been expended in establishing and implementing the reserve training program. It must be borne in mind that the program is designed primarily for the protection of our country, not for the welfare of the individual reservist. It is obvious, however, that the reservist must believe that the program is worthy of his time and effort or it will collapse from its own weight. Constructive criticisms are welcome at all times.

ORGANIZATIONAL TRAINING

The Air Force reserve training program offers many different types of training for the reservist, but I plan to discuss only that part of the program that applies to the officers of the Medical Service.

The most highly organized units are the medical groups of the organized reserve wings, 25 of which are located throughout the country and near the larger centers of population. These medical groups consist of from 14 to 38 officers and from 71 to 110 air

From Headquarters Continental Air Command, Mitchel Air Force Base, N. Y.
Presented at the Armed Forces Medical-Military Symposium at the U. S. Naval Medical School, Bethesda, Md., and the U. S. Naval Hospital, Philadelphia, Pa., 19 and 21 October 1953, respectively.

mounted on aluminum plate and wire as shown in figure 2. After wiring is completed the assembly is mounted on the box shown in the lower left hand corner of figure 1 and the bulb end of the thermostat is placed above the heating elements. The fan plug

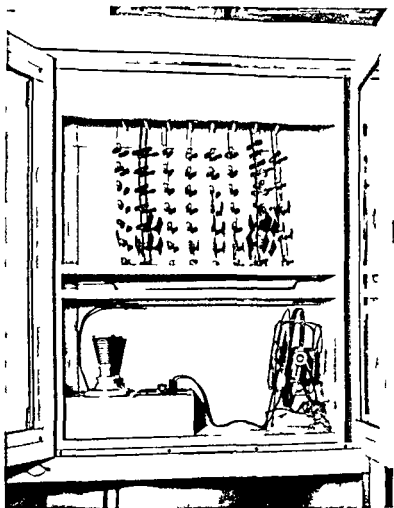


Fig 1

is connected to the female wall receptacle a thermometer is hung from the aluminum tube in the film compartment the switch is turned on and the thermostat is adjusted for proper temperature. The blower must always be in operation while the heating elements are turned on but if only air circulation is desired the heating elements can be removed.

I have found that the normal opening and closing of the cabinet to insert or remove films is sufficient to circulate and change

the air when it becomes saturated with moisture. Danger of a fire caused by the dryer is very slight because the thermostat prevents the heating elements from overheating. Because they are connected in series only half their normal heat is produced. The possibility of a short circuit in one of the electrical connections is no greater than with any other electrical appliance.

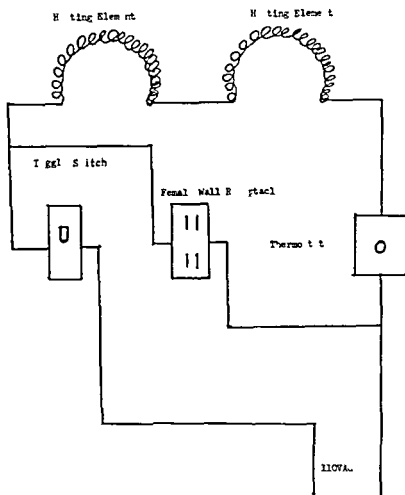


Figure 2

The cabinet shown in the illustration is 30 inches in height, 25 inches in width and 11½ inches in depth; however, any cabinet with measurements approximating these would be adequate. If no cabinet is available, a back panel and door may be placed on the unit which could then be mounted on the wall of the x-ray developing room.

This apparatus will dry 120 dental films completely in less than 10 minutes.

MODIFIED STRETCHER FOR PATIENTS WITH INJURIES OF THE CERVICAL SPINE

H TODD STRADFORD *Command MC USN*

UNDER ideal conditions, the transportation of a patient with injuries of the cervical spine is difficult and hazardous. In the field movement of such a military patient is a much greater problem. By devising a traction apparatus from easily accessible materials for the ordinary field stretcher, this problem was simplified so that such patients could be evacuated by helicopter.

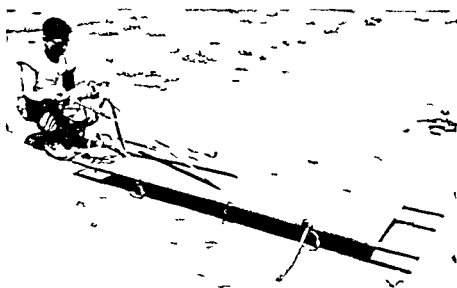
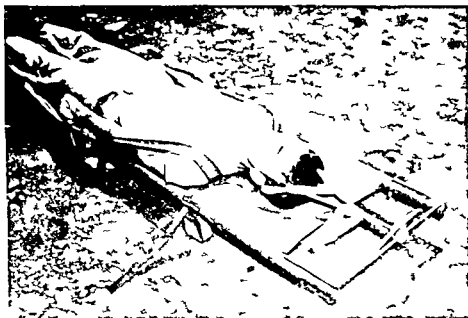


Figure 1

It was found that the field stretcher could be modified to serve this purpose. Two aviation harness belts were sewed to the stretcher as shown in figure 1. The harness is carried across the patient's shoulders and snapped over a hook on each side of

From Headquarters 1 Medical Battalion 1 Marine Division (Reinforced), Camp
Stradford is now assigned Headquarters 3d Marine Division Fleet Marine Force
Camp Fleet Post Office San Francisco California

*Figure 2*

the stretcher frame The adjustable slide of the harness is then snugged up The long straps permit adjustment to fit either a tall or a short person, and crossing them behind the patient

*Figure 3*

stabilizes the straps over the shoulders yet causes no pressure on the spine or chest. Figure 2 shows an improvised head harness with rubber tubing traction. The removable bar and pulley frame is versatile and can be stabilized by hanging weights, elastic, or Spanish windlass traction; the latter is demonstrated in figure 3. The bar was constructed from parts of a Thomas splint and a pulley, and was anchored by inserting it through two drill holes at a point in the stretcher frame where both metal and wood are traversed. A band of adhesive tape wrapped over the bar prevents any possible mishaps in handling. Figure 4 shows the strap hooks; the headpiece is detached.



Figure 4

This modification of the stretcher adds very little weight and does not alter its over all size. It is easily carried and fits in the conventional means of transport including all types of helicopters.

Alteration of this stretcher in this manner does not prevent its use for evacuation of other types of casualties. It should also be found useful by civilian disaster units.

Financial Support for Atherosclerosis

Proceeding along the lines indicated by the cholesterol concept of atherosclerosis, both experimental and clinical research on atherosclerosis can be expected to report continued significant progress in the years immediately ahead provided adequate financial support for such studies is forthcoming. Undoubtedly further advances will eventually bring fruitful therapeutic and prophylactic means applicable to man.

—LOUISA KATZ, M.D.

H I B H I p 77 J ly-A f 1953

OFFICIAL DECORATIONS

SILVER STAR

Morton I Silver Lt (jg) (DC) USNR

LEGION OF MERIT

Gennaro B ilicat *Comdr* (MC) USN
 Ruby G B d l y Lt. Col. NC, USA
 Pear n W Brown Col. DC, USA
 Francis L Carroll Lt. Col. MC, USA
 W l l m M. F w l *Capt.* (DC) USN
 E g n R H ing *Capt.* (MC) USN

Jam R. Karr Col. MC, USA
 F d n k B Lukins *Comdr* (DC) USN
 Oc B M r t son, *Rear Adm.* (MC) USN
 Dean Schambe Col. MC, USA
 Max H. W tki Col. USAF (MSC)

BRONZE STAR MEDAL

R y J Adam *Capt.* MSC USA
 Gusta T And n, Lt. *Comdr* (MC) USN
 Contr d R. Arm tro g *First Lt.* MSC, USA
 Al x ad r Blum Lt. (jg) (MC) USNR
 Shelby W Brown, J *First Lt.* MSC, USA
 Arthur J Carbon ll Lt. Col. MC, USA
 P t T Ca l Lt. (jg) (DC) USN
 Sal r J Co hra *First Lt.* MC USA
 Aurven C. D B rry *Capt.* DC, USA
 D v d A. Dobso J *First Lt.* MSC, USA
 Franci J F ar n *First Lt.* MSC USA
 Franc L Fl t Lt. Col. DC, USA
 Lyl G Fritz 2d Lt. MSC, USA
 Frank T F t J *Capt.* MC, USA
 J m s W Gil hr Lt. (MC) USN
 Franklin H. Graue Col. MC, USA
 H w d P G ves Lt. (jg) (MC) USNR
 Jo ph J Gut *Capt.* MSC, USA
 M t E Hanl y *First Lt.* MSC, USA
 William D H w l y Lt. (jg) (MC) USNR
 J hn R. H km Lt. (jg) (MC) USNR
 F J H nn y *First Lt.* MSC USA
 I gomar A. H be g Lt. Col. MSC, USA
 R bert W Jam n, *For t Lt.* MC USA
 Clar R. J n J *For t Lt.* MSC USA
 Ol v R K ndr k Lt. Col. MC, USA
 R bert L K g, J Lt. (MC) USN
 Edwa d C K bl ck *May* MSC, USA

Rt hard A La in Lt. (MC) USN
 T bert D Leonard, 2d Lt. MSC, USA
 Erwin S L gh rma *First Lt.* DC, USA
 John T Lo d, Lt. (MC) USNR
 Daniel E Mahaff y Lt. (jg) (MC) USNR
 Vincent J Mar ki, Lt. (jg) (MC) USNR
 Thomas L McN il *First Lt.* MC, USA
 Norman C. M *First Lt.* MSC, USA
 W lliam L. Muel man *Capt.* MC USA
 Howard E Nepp *First Lt.* MC, USA
 Frank E Osmer *Capt.* MSC, USA
 Ralph C. Parker *Comdr* (MC) USN
 Jame J P tee *Capt.* MC, USA
 Burton E. Phill p *Capt.* MC, USA
 Irving Pul s, *First Lt.* MSC, USA
 Austin R dmon, *Capt.* MSC, USA
 Wilf d A. Ris Lt. *Comdr* (VC) USNR
 Av ry M R gers 2d Lt. MSC, USA
 J hn A. Salomone 2d Lt. MSC, USA
 H wa d P Sawye J *Capt.* MC, USA
 Donald G Schl gheck *First Lt.* MC, USA
 Thoma J Shelton, *Capt.* MSC, USA
 Charles Sho *First Lt.* MC USA
 Jam H. S yde Lt. (DC) USN
 W l P s nborg Lt. (MC) USNR
 Harold Sussman *First Lt.* MC, USA
 Cha l S Turn r J Lt. (jg) (MC) USNR
 Geo ge B V gt *First Lt.* MC, USA

First Oak Leaf Clust

In h d partm nt each month th nam f off c rs f the med cal rv s wh have
 be wa d d d c rats by the United Stat Army Navy or Air For inc the be-
 g ing f he Kor a campa gn publish d f llowing rec pt of ths nformati n
 fr m ll al ourc —Editor

BRONZE STAR MEDAL—Continued

D no J W d Capt. MC USA	Geo g R Wilbour Fir t LL MSC, USA
P l j W tw rth Capt. MSC USA	Theodor H W l LL (jg) (MC) USN
L wr A Whool ry Lt Comdr (MC) USN	Sta l y I W ll LL (jg) (MC) USNR
Coll W ght, LL Col MSC, USA	

COMMENDATION RIBBON

W l D All d Fir t LL MSC, USA	F nc W K bbs Capt. MC, USA
A hur M. And so LL (jg) (MC) USNR	S eph V Landt h LL (MC) USN
J b M. Appl Fir t LL MC USA	N m L Fir t LL MC USA
Annet B LL (MC) USN	R be O L p LL (MC) USNR
J k C. B g LL (VC) USN	G ham Marg Fir t LL MSC USA
Leona d B B rm LL (jg) (MC) USN	S muel C. Ma LL (MC) USNR
William E Bowles Fir t LL MSC, USA	J h H M L ughlin LL (jg) (MC) USNR
Cha l H Braml Col. USAF (MC)	D ld A M L LL (MC) USNR
R nd t L B w ll Col. USAF (MC)	J hn P M ur g Capt. MSC, USA
D l E Brown Capt. MSC, USA	J m G Mo Col USAF (MC)
Thom K Bur p LL (jg) (MC) USNR	Donald C. Ove y LL (jg) (MC) USNR
William E Cap Fir t LL MC, USA	Arthur E. P ul y CWIC, USN
Cha l B Ch mbe LL (jg) (MC) USNR	Mur y P w Fir t LL MSC, USA
F k F Daugh Capt. MC USA	J me L P Capt. DC, USA
Carl W D O LL Comdr (MC) USN	William F P so J LL (jg) (MC) USNR
Iva C. D mm k J LL Col MC USA	Ch l P R hard LL (jg) (MC) USN
Sam l Doughry LL (VC) USNR	R ymond N R Capt. MSC USA
How d B Dr l WOHC USN	M k L Sha on CWIC, USN
J h T E g n, J LL (VC) USN	M ur E S mps o Comdr (DC) USN
J me G E pey j LL Col. USAF (MC)	J k E S pl Fir t LL MSC USA
Fra k A F lk LL (jg) (MC) USNR	A y hur L. S ee Col USAF (MC)
Orr ll M. Gra LL (VC) USN	W ll m R Th m LL (jg) (MC) USN
H rry W Ge y LL (jg) (MC) USNR	R ha d H Tull LL (MC) USN
Al H. H Capt. MSC, USA	J b W V Fir t LL MC, USA
R g nald S H rry LL (jg) (MC) USNR	Be R. W l Lt Comdr (MC) USNR
Irw H ym Capt. DC USA	Col M. W l h LL (MC) USNR
Edw d P I Comdr (MC) USN	L H W ll LL (jg) (MC) USNR
Ruel C. Irw Maj. MSC, USA	J h E W ll m LL (jg) (MC) USNR
Harv y S. J b so Comdr (DC) USN	L w D W ll m Comdr (MC) USNR
How d A J hmo j Fir t LL MSC, USA	Cha l B W ll gham WOIC, USN
Clar Kapl Capt. MSC, USA	Harry T W kl Capt. MSC, USA
T ml P K nd k Fir t LL MSC, USA	H y M W ll M j MC, USA
Gordo K oedy j Fir t LL MSC USA	William H. Y g j Capt. MC, USA

Adequate Breast Biopsy

Earlier diagnosis of the breast cancer demands prompt biopsy of any localized area that varies from the surrounding tissue. Watchful waiting is a dangerous policy that may deprive the patient of treatment during the period of curability. Adequate biopsy consists of the removal of sufficient breast tissue to reveal the presence of any obvious or occult cancer by immediate thorough pathologic examination.

—THOMAS A. SHALLOV, M.D., et al.

A. M. A. A. h w of Surgery pp 535-536 Oct 1953

Program of A M A Military Medicine Section, 23-25 June

Timely professional subjects of equal interest to both civilian and service physicians have been included in the program of the Section on Military Medicine to be presented during the annual meeting of the American Medical Association in San Francisco 21-25 June 1954 under the chairmanship of Major General Harry G. Armstrong, Surgeon General, U. S. Air Force.

The section will meet on the mornings of 23, 24, and 25 June, according to Colonel Charles L. Leedham, MC, USA, Secretary of the Section, who also announced that the final morning would be devoted to a joint session with the Sections on General Practice and Anesthesia on the subject of pain.

Following is a complete program of the presentations to be made before the section.

Wednesday 23 June

Military Medicine Today—Maj. Gen. Harry G. Armstrong, USAF (MC), The Surgeon General, U. S. Air Force.

The Initial Care of the Severely Wounded—Maj. Curtis P. Artz, MC, USA, Brooke Army Medical Center, Fort Sam Houston, Tex.

Arterial Grafts in Military Surgery—Capt. Robert B. Brown (MC), USN, U. S. Naval Hospital, Bethesda, Md.

The Tissue Bank in Military Medicine—Capt. Edwin Coyle (MC), USN, U. S. Naval Medical School, Bethesda, Md.

Chororetinal Burns Produced by Atomic Flash—Col. Victor A. Byrnes, USAF (MC), Headquarters, U. S. Air Forces in Europe, Wiesbaden, Germany.

The MEND (Medical Education for National Defense) Program—Dr. Stanley Olson, Dean, Baylor University College of Medicine, Houston, Tex.

Current Problems in Military Medicine—Dr. Frank B. Berry, Assistant Secretary of Defense (Health and Medical).

Thursday 24 June

Rapid Test for Determining Antibiotic Treatment—Lt. Col. Vincent M. Downe, USAF (MC), Capt. William E. Dye, USAF (MSC), Capt. Roland B. Mitchell, USAF (MSC), U. S. Air Force School of Aviation Medicine, Randolph Air Force Base, Tex., and 1st Lt. David F. Hickey, USAF (MSC), L. C. 1, Air Force Base, Tex.

Thursday 24 June—Continued

Th *l t r m d t* *C r o n a r y S y d r o m* *M l t r y P* *l*—*C a p t A h*
G r y b l (MC) *U S* *U S* *N a l S c h o o l f A i a t* *M d* *P n s* *l F l*

T b *V l* *f E* *s T l* *c T t s P d c t g C d c P a t h o l g y*
(A 10-y f l l u u p t u d y f 1000 m l t a r y p s o l)—*C o l T h m a s W*
M t t g l y M C, U S A W l e R d A r m y H o p t a l W s h u g t D a C d D r
G g P R b h N e w Y k N Y

H m a T o l *R l t o t D t r u t i v e F c*—*B r g G e O t s O*
B e n s o J U S A F (M C) O f f o f T h S u r g G r a l D e p t l t h A
F o c e W h g t D C

M d l E x p r i c *C m m t P O W C a m p N t h A*—*C a p t*
C l c e L A d M C U S A C a p t S d y E n s t M C U S A L t r
m a A r m y H o p t a l S a I r a s c C a l f C a p t A l e d M B o y s M C,
U S A C a p t G M L m M C U S A B k A m y H o p t a l F o r t S m H u s t
T d C a p t W l l i a m R S h a d h M C U S A W l t R e d A r m y H o p t a l
W h g t D C

M l t r y M d c *C l M d* *a n d t h A m n M d l A* *t o*—
D r L w H L B u e P t P r e d t A m c M d l A o c t S e c
t r y-G r l W l d M e d c a l A o i a t o N w Y k N Y

Friday 25 June

J o t M t g w h t h G e l P c t S c t d t h A t h S e c—
S u b j P n

Cancer Chemotherapy

The whole concept of specific cancer chemotherapy depends upon the existence of specific anabolic patterns for nucleic acid by particular cell types including the neoplastic. There is good evidence that these exist for normal cells although they will unquestionably turn out to be much more complicated and presumably much more varied and specific than present methods permit us to define. Different and so useful specificities will undoubtedly be found to exist for different types of neoplasms. This has also been advanced as an argument by those who oppose work in cancer chemotherapy. The most pessimistic pronouncement on this point is one recently made that 1 000 different agents will be needed for 1 000 different kinds of cancer. This is unlikely since perhaps the majority of the cancer deaths are due to disease of a few general types. Data already existing on human therapy indicate that the responses by minor variants within these types tend to be similar even though not identical.

—C P RHOADS

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p 79 J 15 1954

REGULAR MEDICAL CORPS OFFICERS CERTIFIED BY SPECIALTY BOARDS

The American Board of Radiology

Activated in 1934, the American Board of Radiology on 30 June 1953 had certified 4,341 physicians in the various branches of this specialty of whom 73 were regular officers of the U S Army, Navy, and Air Force. According to the respective surgeons general, these specialists are:

Samuel H. Alexander Col. USA
Harold I. Amory Col. USA
Ensign C. Aulls Capt. USA
Robert J. Ayell Capt. USA

Leonard H. Brube Comdr. USN
William E. Barry Lt. Col. USA
John C. Batts Maj. USA
Albert J. B. Lt. Col. USA
Charles F. Brice Rear Adm. USN
Carr E. Brant Capt. USN
Harry L. Bruman Col. USA
George C. B. Lt. Col. USAF
George C. B. Jr. Capt. USA
James G. B. Capt. USN
Clarence D. Brigh Comdr. USN

Richard Y. Cad Capt. USAF
Phillip L. Clend Comdr. USN
William S. C. Comdr. USN
James P. Coey Brig. Gen. USA
Carroll S. Crawford Maj. USA

Giffen C. Daughtridge Capt. USN
Edward M. DeYoung Col. USA
Robert C. D. that Capt. USN
Dill F. Dullum Col. USA

Lyle H. Edlbi Lt. Col. USA
Richard W. E. Lt. Col. USAF

John S. F. Jr. Lt. USN

Charles G. G. Jr. Capt. USN
L. D. Graybill Capt. USA

Alfred O. H. Lt. Col. USA
Norman H. Hadsty Capt. USN
Richard C. H. Capt. USA

John L. Hatch Capt. USN
John H. Heald Lt. USA
Romeyn J. Healy Jr. Col. USA
John A. I. H. Wood Col. USA

Reginald C. J. K. Capt. USA
Bruno O. Jun. Comdr. USN

James M. K. Gan Maj. USAF
Douglas S. Kellie Col. USA
Charles H. Kimball Capt. USA
John M. K. Bl. Maj. USAF

Leew La. G. Comdr. USN
Joseph H. Laws Lt. USN
Frank Y. L. Col. USA
Elmer A. Lodmell Col. USA
George F. Lull Jr. Lt. Col. USA

Archibald G. M. Martin, Maj. USAF
Malcolm W. M. S. Comdr. USN
Robert V. McAllister Maj. USA
Theodore M. Carthy Col. USA
Kenneth L. M. Ewe Maj. USA

Hyman R. O. H. Jr. Col. USA

Pulaski P. D. Col. USA
Ralph S. P. Jr. Maj. USA
Charles B. Perkins Col. USAF
William E. P. Jr. Capt. USN

Allan B. Ramo Col. USA
Walter R. Bley Lt. Comdr. USN

Charles E. Spillman Col. USA
Albert H. Stadman Capt. USN
Robert J. Stenberg Capt. USA
Donald W. S. Stiff Maj. USA

The following names of officers certified by the American Board of Radiology will be published May

RADIOLOGY—Continued

Donald R Tyl Maj USA

Robert J Vugh Capt USN

Hild A V Lt Col USA

Rogers K W Lt USN

Pio W Col USA

Sylvester F W Lt Col USN

James G Wood Jr Maj USA

John P Wood Capt USN

William A Wilm Comdr USN

Peter Za Col USA

DEATHS

FOY Edgar Thomas Capt (MC) USN Hdqtr Fleet Mr For
Pacific Fleet graduated from Temple University School of Med 1928
served on duty from March 1942 to October 1946 recalled to
duty June 1948 died 26 February 1954 age 52 of cardiac disease
at on duty at Temple Army Hospital Hqtr T H

MARTIN Robert Glasgow Ltens (DC) USN Flt Asst Svc Sq d
at Coco Solo C Z graduated from Michigan University College of Dent
istry 1946 died on duty July 1946 died 13 February 1954 age 31
of heart cut by barbed wire at U S Naval Hospital Coco S
C Z

WITHERS Samuel Mecham Jr Major MC USAR graduated from University
of Georgia School of Medicine in 1935 served during World War II hon
orably discharged on 22 November 1945 died
on duty 1 October 1950 command officer of the 548th Genl Depo
Korea where he died 19 July 1953 age 48 of myocardial infarction

A MESSAGE FROM THE A M A

During the past several weeks the Council on National Emergency Medical Service has received several letters from physicians in military service suggesting that their current tour of active duty be cut short because of the fact that they were in service during World War II. Those who have submitted these suggestions were for the most part, classified in priority II under the "doctor draft law" prior to their entrance on active duty. They believe that an inequitable situation has been created by the requirement that they serve an additional 24 months, whereas a man with little or no service from priority I or III is also required to serve only 24 months. In view of the continuing interest in this provision of the law it is thought that a review of the history of the actions of the Association with respect to priority II registrants is in order.

In the summer of 1950 hearings were held by the Armed Services Committees of the House of Representatives and the Senate on the bills which became Public Law 779, 81st Congress. In presenting its testimony, the American Medical Association approved several amendments to the bill, one of which recommended that the present priorities II and III be reversed. Our recommendation in this regard was not accepted and substantially the present priority system was established.

Between the time of the passage of the original Act on 9 September 1950 and its expiration date of 1 July 1953 most of the men in priorities I and II were called into service. It was believed, therefore, at the time of the hearings last spring on the proposed extension of the law to 1 July 1955 that a new formula must be devised to provide the greatest equity to those men who had a substantial amount of service during World War II, whether they were registrants under the law or were on active duty.

In his appearance, on behalf of the Association, before the Armed Services Committee of the House of Representatives on 24 April 1953, and again before the Senate Armed Services Committee on 20 May 1953, Dr. Edwin S. Hamilton said, in part:

Inasmuch as the registrants in priority II with the exception of those having temporary deferments have been called into service it would appear that the only remaining way in which a measure of equity can be

From the Council on National Emergency Medical Service of the American Medical Association. The views and opinions expressed are not necessarily those of the Department of Defense. —Editor

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phy c ns wh had b tant l c dur g World W II Th A oc
t on th for s mmend g that th peiod of d ty req r d f med
c l reg tr or rv t who r c lled to milt ry s be
l m r d to 12 months f they had 12 or mor month f s rv ce oc
Sept mbe 16 1940

In enacting Public Law 84-83d Congress the Congress adopted staggered periods of service for physicians including those in priority II. This obviously did not comply with our recommendations in this regard.

With the increase in the number of inquiries from physicians thus effected and the lull in Selective Service activities because of a temporary surplus of physician applicants it was believed that the Department of Defense would be receptive to our recommendation concerning the reduction in the period of service required of physicians with substantial military duty during World War II. Inasmuch as the periods of required service specified in Public Law 84 are maximum periods only it is apparently possible to reduce the required period of service by administrative regulations.

For these reasons a letter was written to Dr. Melvin A. Casberg, then Assistant Secretary of Defense (Health and Medical) on 16 December 1953 restating the recommendation quoted above. It was suggested that this reduction should apply to priority II physicians whether they are on active duty at the present time or whether they are in a deferred status.

The latest communication which the Council has received in this regard is a letter dated 28 December 1953 from Dr. Casberg which states:

Th is r ply to your lett of D mbe 18 1953 comm d g h
ly l of pr oty ll phy ns in the A med For wh had
rw l mon h or mor of rv dur ng W ld W r ll Cons d r t on w ll
be g to your commend t on

It is the hope of the Council that suitable administrative regulations will be promulgated in the near future.

EDITOR'S NOTE It has been decided that the Army will need about 4500 medical officers during FY 1954. The question for the Army will be how many more will be published in the Journal of the American Medical Association, the Journal of the Study of American Medicine, the Journal of the American Hospital Association, the Journal of Medical Education and Health Journal of the American Dental Association or some other journal. On June 30 of this year, after for duty in Air Force and Navy we are already in the way.

PUBLICATIONS BY OFFICERS OF THE MEDICAL SERVICES

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W l n, F W L Col USAF (MC) P mty m g l i y ung d l *Am J
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BOOK REVIEWS

PERIPHERAL NERVE INJURIES Principles of Diagnosis by *Webb Haymaker M D* and *Barnes Woodball M D* 2d edition 333 pages 272 illustrations W B Saunders Co Philadelphia Pa 1953 Price \$16

The second edition of this sterling contribution to the diagnosis of peripheral nerve injuries has been revised and augmented with many new illustrations and about a hundred additional pages

The book is composed of four sections of which the first provides an anatomic background for peripheral nerve examination on a segmental basis employing numerous detailed diagrams indicating the skin muscle and skeletal relationship The second section describes and illustrates the method of examining an acute peripheral nerve injury naming the muscles nerves and spinal segments involved The third section is concerned with the classification of nerve injuries on a pathologic basis It describes the various special tests presently used in diagnosis and prognosis and the manifestations of nerve injuries such as muscular atrophy irritative phenomena alterations in sensibility and autonomic activity trophic disorders contractures and pain The final section deals with the diagnosis of injuries to plexuses and peripheral nerves after sufficient time has elapsed for anatomic changes to have taken place

The book is profusely illustrated with diagrams of plexuses and nerves and with photographs showing deformities and cutaneous sensory defects resulting from nerve injuries This book is a must in the library of every hospital of the armed services and should be on the reference shelf of every civilian physician in traumatic surgery

—W J JAMES *Coral* (MC) USN

MEDICAL TREATMENT OF DISEASE by *Henry A Christ an, M D LL D* Dale G F and M S M D and *Maurice A Schnitke M D* Volume VIII of Oxford Loose Leaf Medicine 965 pages Oxford University Press New York N Y 1953 Price \$25

Because of the periodic acceptance of new concepts methods and tools in medicinal treatment a loose leaf volume has much to recommend it The preface states "A loose leaf book such as this makes changes easy and inexpensive since the purchaser may simply obtain revised pages for insertion in the volume" and revisions are to "be prepared whenever important changes in treatment are found clinically worth while"

The 12 parts and 80 chapters include those conditions which are in the province of the internist and the physician. They present usually in narrative style the essential features of the therapeutic and prophylactic measures that in the opinion of the authors have proved clinically effective for the hundreds of specific situations considered. The methods described are for the most part conventional and in general agreement with other current and authoritative sources. The metabolic, cardiovascular and gastrointestinal sections are particularly well done. Each chapter has a short bibliography and the entire book is covered by an abbreviated index. There are already several excellent books on medical treatment available and this one covers the same extensive field with a thoroughness similar to that of these other reputable texts. Its advantage is that it is loose leaf and accordingly can be kept up to date. —J H WARD J Capt (MC) USN

THE PRACTICAL MANAGEMENT OF DIABETES by Edvard Tolst M D
 edited by Paul Gyorgy M D L L i M D d S O W /
 M D 93 page Chas C Thomas Publ Co Springfield Ill 1953
 Pp \$3.25

In this monograph the author presents his views on the controversial subject of the free diet in conjunction with prolonged-acting insulin in the management of the diabetic patient. The criteria of satisfactory control of diabetes, as the author states, lies in the triad of freedom from diabetic symptoms, maintenance of weight, and absence of ketonuria. Relatively little emphasis is placed on the importance of hyperglycemia or glycosuria as indications for adjusting the diet or insulin dosage.

The opening chapter is devoted to a brief historical review of the management of diabetes and of those therapeutic goals in vogue during the period preceding the discovery of insulin in 1923. This is followed by the author's clinical method of management of the patient with uncomplicated diabetes, employing the free diet and intelligent dosing for hyperglycemia and glycosuria. Succeeding chapters deal with the manipulation of treatment required in the diabetic patient with acute and chronic complications. The last chapter titled "Hyperglycemia and Glycosuria: Do They Cause So Called Diabetic Complications in the Insulin Treated Patient?" will invoke careful thought and critical consideration. The monograph contains no tables of food composition or caloric values, and no formulas for food allowances or diet prescription based on the nutritional status or caloric requirements of the diabetic patient. While a few case histories serve to illustrate the clinical progress of patients under the author's method of diabetic management, there are no statistical data relating to the infrequency of acute and chronic diabetic complications which might lend support to the author's method.

This inexpensive and well-written monograph should be read by any physician who has the responsibility of caring for diabetic patients.

because the author is a pioneer and champion of the free diet school of diabetic management —E C KENNEY Capt (MC) USN

PHYSIOLOGY OF MUSCULAR ACTIVITY Originally by *Eduard C Schneider* M P E Ph D D Sc By *Peter V Karpovich* M P E M D 4th edition 340 pages illustrated W B Saunders Co Philadelphia Pa 1953

This book a complete revision of the third edition was written for the student of physical education and those who are concerned with the reaction of the body to physical activity. The author is ably qualified to discuss the medical implications of his subject as well as to express the viewpoint of the physical educationalist. Anatomy physiology chemistry and kinematics of muscles are briefly discussed but the author states that for a complete understanding of the secondary effects of muscle activity a knowledge of the metabolic integration of the respiratory nervous and cardiovascular systems is essential. These topics are presented in a manner designed to be helpful to coaches physical educationalists athletes and team physicians. The book is not sufficiently detailed nor is the subject matter pertinent enough to attract doctors of medicine as a group however it is full of little known but authoritative facts and results of investigations concerned with fatigue fitness tests environmental influence and other relative subjects which will serve as a concise reference.

Doctor Karpovich has written a well-organized book in a lucid and straightforward style. The illustrations and charts are adequate clear and appropriate throughout. He cites many authors in allied fields and includes 467 references in his bibliography.

—H B LUSCOMBE Col MC USA

ESSENTIALS OF NURSING by *Helen Young R N* and *Eleanor Lee A B R N* Edited by *Helen F Pettit R N M A* 527 pages G P Putnam's Son New York N Y 1953 Price \$4

Written by two professional nurses the new edition of this book should be valuable for the beginning student nurse. The first part of the book gives a general introduction to hospital administration and is followed by a discussion of routine procedures including the admission and discharge of patients. The section on diagnostic and therapeutic procedures is comprehensive and the nurse's role as an assistant to the physician in certain procedures is particularly well defined. A chapter on rehabilitation has been added to this edition.

Throughout the book the sociologic and psychologic approach to nursing care is emphasized. Illustrations in this book include some excellent line drawings with parts of equipment well labeled. Although a glossary is not included in the book terms are well defined and subjects are easily located in the index. Nursing instructors should find this book of value either as a text or reference in basic nursing classes —A T BELL Capt USAF (NC)

CLINICAL MANAGEMENT OF BEHAVIOR DISORDERS IN CHILDREN by
 H ry B kw n, M D d Ruth Morr B kw M D 495 page ill
 trat d W B S d a C Ph l d lph a P 1953 P \$10

This book will be of special value to the medical officer assigned to a station where no psychiatrist or psychologist is available. Early chapters are devoted to the description of the growth development and psychologic c re of the newborn infant and child followed by an excellent discussion of the treatment of the physically ill and handicapped child. Behavior disorders are described in clinical terms and cause dagnosis and treatment are discussed thoroughly. The diagnostic section has been emphasized by the authors in order to enable the physician to establish his own conclusions. Included are material for interviewing history taking graphic tests examination and projective techn cs which should pr ve useful. Problems rel ted to mental functioning and emotional development are given consider ble attention as are developmental abnormalit s. A brief but interesting chapter on organic disturbances with a large psychic component such as asthma dermatoses and ulcerative colitis is provided.

The material is well organized concise and complete with a double column format of very read ble type with heavy subtitling. Illustrations are few but well selected. An extensive subject index and list of references including 23 general texts are provided. The authors have succeeded in presenting a very readable book with cause diagnosis treatment and general cons derations descr bed in clinical terms and integrated with the total care of the child.

—M KURZROK C md (MC) USN

MODERN TRENDS IN UROLOGY d t d by E W R ch M C M S
 F R C S with a f ew d by L d W bb J hns K C V O
 C B E D S O T D M B LL D F R C S 476 pag II
 ur d P l B H ebe In New Y k N Y 1953 P \$12 50

This l test addition to the Hoeber Modern Trend Series is made up of 38 sections each wr tten by an expert who has won universal recognition in his particular specialty. Excellent discussions are included on anesthesia in urological surgery radiological therapy of vesical neoplasms the urological aspects of gynecology and advances in radiology of the urinary tract by author ties in these fields rather than by urologists. Except for the sections by one American and one Swedish author the text is written by outstanding authorities of the British Empire. In general the views of these observers coincide well with those held by American urologists. Of particular note is their advocacy of the trend away from radical surgical methods (i e total cystectomy and ureteral transplantation) in all but a certain carefully selected group of patients with vesical neoplasms.

For some reason a discussion of neoplasms of the external genitalia is omitted although the somewhat controversial topic of the treatment

(radical surgical and radiological) of the various types of tumor of the testis has been widely considered in urological writing during the past few years

References are furnished at the end of each section both American and European publications have been consulted thoroughly. The section on the cause and prevention of urinary calculi is particularly notable for its thoroughness and its concise and lucid exposition of a perplexing and complicated problem. The volume is beautifully printed and illustrated and it will be of greatest interest to the resident and to the practitioner. It is not intended to supplant a larger textbook devoted to a complete consideration of the basic principles as well as to the practice of this comprehensive specialty. As a complete study of recent advances in this important field, this timely volume is highly to be recommended to the general as well as to the genitourinary surgeon.—S. JOHNSON *Capt (MC) USN*

SYMPTOMS OF VISCERAL DISEASE A Study of the Vegetative Nervous System in Its Relationship to Clinical Medicine by Francis Marion Pottenger M.D. LL.D. 7th edition 446 pages with 87 text illustrations and 10 color plates. The C. V. Mosby Co. St. Louis Mo. 1953. Price \$7.50

This monograph on the anatomy, physiology and pharmacology of the autonomic nervous system and the part it plays in producing the symptoms of visceral disease is the seventh revision of a work first published in 1919. Earlier editions, based on the premise that clinicians generally had ignored the autonomic nervous system in its relation to clinical medicine, emphasized its importance in the understanding of symptoms produced by disease. The new edition is produced especially for those interested in visceral reactions to stimuli. The author points out the necessity of studying the patient and his reactions, as well as the disease process itself, and presents a careful study of the reactions of man to stimuli from his internal environment.

The concept of viscerogenic reflexes, especially those resulting from pulmonary disease, is covered in detail, as is the anatomy and physiology of the vegetative nervous system. Pharmacology is discussed briefly, but is not up to date.

The pleasure of reading the monograph is marred by references to recent literature which was published in 1919 or 1922. Otherwise it is an interesting book for those who wish to study the history of the development of knowledge of the autonomic nervous system and to learn many facts and opinions on its function. For more recent information the student will have to look elsewhere. The book is attractively printed and bound and the illustrations are excellent.

—E. V. JOBE *Capt (MC) USN*

SECTIONAL RADIOGRAPHY OF THE CHEST by *Irving J. K. M. D.*
Edward D. Churchill M. D. 154 p. g. Illustrations. Springfield
 Publishing Co. New York, N. Y. 1953. P. \$7.50

This short text presents a subject of primary interest to the radiologist. It consists of four chapters, a section on illustrations, and a lengthy bibliography. The chapters are brief and are actually more of an outline than a detailed analysis of principles and methods, selection of positions and levels, anatomy, and pathology. The author stresses the importance of planigraphy in diagnosis, of precise localization by lung segments, and of evaluation of therapeutic procedures.

The illustrations are excellent and include simple diagrams where necessary. Comparative films taken by conventional methods are interposed to stress an important point. The quality of the reproductions of cross-sectional films is the best feature of the book.

This text will be of value to the radiologist interested in planigraphy and also to the chest physician and thoracic surgeon.

—W. S. COLE, *Commanding (MC) USN*

THE YEAR BOOK OF RADIOLOGY edited by *J. H. Floyd, H. L. M. D., F. R. C. R., J. M. Hodgson, M. D., H. L. W. J. Cox, M. D., J. V. P. C. Hines, M. D.* 462 p. g. Illustrations. The Year Book Publishers, Chicago, Ill. 1953. P. \$8.

This book consists of abstracts of articles published between June 1952 and June 1953. It has two main divisions on diagnosis and radiotherapy.

The text is easy to read and understand. Frequently the editors add a footnote to the abstracted articles, giving the reviewer's perceptions and opinions. The reproductions of radiographs are excellent and the best that I have seen in any publication. This is partially due to the very high quality of the paper used in the book throughout.

This volume is interesting, helpful, and stimulating. It is a must for all radiologists and should prove valuable to all physicians concerned with radiology in any of its aspects.

—H. A. VINSON, *Lieutenant Colonel (MC) USA*

SURGERY OF REPAIR AS APPLIED TO HAND INJURIES by *B. K. R. K. M. S., J. A. R. H. K. J. L. M. S.* 256 p. g. Illustrations. The Williams & Wilkins Co., Baltimore, Md. 1953. P. \$8.

This interesting and easily read book by two Australian surgeons discusses the general considerations of primary treatment of various types of open hand injuries. The principles as outlined are rational and eliminate some of the confusion that a general surgeon experiences when confronted with massive hand injury. The discussion of tidy and untidy hand injuries is helpful.

The chapter on surgical anatomy and examination and appraisal of the injury reiterates established principles with reference to tendon

repair nerve repair and conservation of hand tissue indicating that even though a useful digit may not result such conserved skin can be used in secondary plastic procedures to obtain a useful extremity. The point is well taken that hand skin is different from any other skin. The discussion on intermediate treatment of unhealed wounds and on massive necrosis of the hand is timely and important and the sections on secondary treatment and plastic procedures for reconstruction of the hand include the indications for further reconstruction. The concluding portion on stumps burned hand injuries in children and hand prosthesis is useful for ready reference.

This book cannot be classified as a primer for hand injuries yet the subject matter is presented so clearly and concisely that it is recommended reading for all surgical residents and industrial surgeons as well as for the general and orthopedic surgeon who may have occasion to treat hand injuries. The reader will not be lost in a mass of detail so that it is a handy book to have close to the operating room for a quick review. —V C STRATTON *Comdr (MC) USN*

MODERN CLINICAL PSYCHIATRY by Arthu P Noyes M D 4th edition
609 pages W B Saunders Co Philadelphia Pa 1953 Price \$6

The author of the fourth edition of this standard American textbook is President elect of the American Psychiatric Association. Such current topics as ACTH reactions to isoniazid, compensation neuroses, child psychiatry and combat neuroses are covered in brief. The book follows the standard nomenclature officially adopted by the American Psychiatric Association.

Dr Noyes's viewpoint is holistic though one sees the influences of both Freud and Meyer throughout the text. The author states that no one theory does justice to all the problems presented by psychiatry. Much attention is paid to a presentation of basic dynamic principles e g mental mechanisms and processes rather than "disease entities" are emphasized. The author emphasizes the interrelationships of psychiatry with respect to some of the clinical problems in the general medical and surgical areas stating: "It would be a happy combination if as much effort were expended in the psychological treatment of preoperative fear and apprehension as there is in the search for a drug to alleviate them."

This book should have a wide range of usefulness. Both the medical student and the psychiatric resident will find it helpful and the nonpsychiatric physician will find it a ready reference. Those physicians preparing for specialty board examinations will find here an extensive practical review.

The style is narrative and easy to read. The book is an excellent presentation in textbook form of modern American psychiatry but a chapter on medicolegal problems in psychiatry would be a valuable inclusion in the next edition. —M SHOOR *Comd (MC) USN*

DIAGNOSIS AND LOCALIZATION OF BRAIN TUMORS A Clinical d E
per me t l St dy Empl ying Fl t c t nd Rad oacti e Trac M h
ods by G org E M M D Ph D 241 page 87 illustr ti
Cha l C Th ma P bl h r Sp i gf ld Ill 1953 Pr e \$10 50

This monograph dealing with the new and rapidly expanding subject of the application of radioactive materials to clinical practice is timely practical and well written In the 11 main sections of the book the author discusses the use of fluorescent materials in delineating intracranial neoplasms at the operating table the preoperative application of radioactive tracer substances for the diagnosis and localization of both neoplastic and non neoplastic lesions the technique (with hazards and pitfalls) of isotope encephalometry and the methods by which the blood brain barrier may be studied with such materials The use of diiodofluorescein (sodium) and the available mechanical apparatus for its clinical and experimental application are described in detail The sources of error however in the use of this substance are succinctly pointed out

This book includes most of the data now available concerning the application of radioactive compounds both at the bedside and in the laboratory The author's enthusiasm though justified by his own fruitful research is tempered by his thoughtful recognition of the limitations of these new techniques He leaves no doubt in the reader's mind that the procedures described must be regarded both as promising and challenging to the neurosurgeon The book is well illustrated well indexed and is the usual fine product of the publisher

—J MARTIN C L MC USA

NUTRITIONAL STUDIES IN ADOLESCENT GIRLS AND THEIR RELATION
TO TUBERCULOSIS by J ph A J bnst M D 320 p g illus
trat d Ch le C Th m P bl h Sp i gf ld Ill 1953 P
\$7 50

This is the well-documented record of a painstaking 20 year nutritional study on adolescent girls most of whom had tuberculosis with the prime purpose of determining the influence of soil in the development of tuberculous disease The author's stated objectives were (1) to follow by roentgenographic examination children after their removal from the contact of their first infection (2) to study the growth process in adolescence as reflected in the nitrogen and calcium balances (3) to determine the nitrogen and calcium balances and the basal metabolism of tuberculous adolescents and to correlate these with the clinical course of their disease and (4) to observe the effect on the course of the disease of changes induced in the balances by dietary and other means

The author attempts to show that the vulnerability of the adolescent girl to tuberculosis is related to a failure to meet the nutritional requirements for growth peculiar to this period and that the disease process may be favorably influenced by the degree to which one suc

ceeds in replenishing previously acquired deficiencies and promoting a normal nutritional state

The book is profusely illustrated with graphs and charts and includes detailed clinical histories. It is a valuable contribution to the epidemiology of tuberculosis and can be read profitably by pediatricians and nutritionists —C W TEMPEL Col MC USA

MAY'S MANUAL OF THE DISEASES OF THE EYE For Students and General Practitioners 21st edition revised and edited by *Charles A. Perera* M. D. 512 pages 378 illustrations including 32 plates with 93 colored figures Williams and Wilkins Co Baltimore Md 1953 Price \$6

This book sets forth in a clear concise easy-to-read manner the tenets of ophthalmology including the basic sciences diagnostic criteria and therapeutics. Its 21 American editions plus many foreign releases testify to its long term acceptance and popularity. Dr. Perera has continued the same high quality of presentation that characterized the output of the late Dr. May.

Despite its relatively small size this is probably the most complete simplified textbook of any medical specialty. Items of particular worth include a simple differential diagnosis of the acute red eye the latest methods of treatment of the uveitides (including the use of cortisone and ACTH) and a section on refraction. An appendix cites the current ocular requirements for admission to the different branches and sections of the United States Armed Forces.

The place of this textbook in the teaching of ophthalmology to medical students is well established while its use as a reference book for general practitioners and optometrists is widespread. Medical officers of the Armed Forces especially those stationed where the services of an ophthalmologist are unavailable would be well advised to have a copy within reach. Its value as a textbook and as a reference for all but the expert ophthalmologist is unsurpassed.

—L. SCHACHNE Lt (MC) USN

PREGNANCY WASTAGE Proceedings of a Conference Sponsored by the Committee on Human Reproduction National Research Council Edited by *Earl T. Engl* 254 pages illustrated Charles C Thomas Publisher Springfield Ill 1953 Price \$8.50

This volume is a collection of articles of particular interest to obstetricians pediatricians pathologists embryologists and those specializing in public health as the unique title would indicate.

It represents an attempt to co-ordinate the findings and viewpoints of the myriad of workers whose particular specialties contribute in some way to the problems involved after fertilization and up to the neonatal period of life. There are 15 articles the longest 35 pages dealing with rather recent data on the subject. The comments appended to most of the articles are pertinent and in most instances by authorities in

this field. It is a stimulating compilation of thought and data which should be repeated at intervals in volume form. Most of the articles have a reference source usually preceding the discussion by participants in the conference or by the chairman and are accompanied by pertinent figures, graphs, charts, or tables. A comparison of statistics on this problem from leading institutions is presented particularly with reference to the geographic peculiarities involved. An introduction to the statistics of abortion is most interesting and enlightening.

If salvage of fetal life is to be improved, a statistical analysis of the problem followed by the investigation of the physiopathology involved and its ultimate correction is in order. This will require the concerted effort of individuals as attested by the participants in these proceedings. — H. L. RIVA, LL. C. I. MC USA

THE NURSING OF THE ELDERLY SICK. A Practical Handbook of Geriatric Nursing by T. N. Rudd. M. D. 108 pages. J. B. Lippincott Co. Philadelphia, Pa. 1953. Pp. \$2.50.

This book deals with certain aspects of the problems of disease in the elderly as they affect nursing care. The author considers that the approach to the aged sick should differ in many respects from that to any other group of patients. Emphasis is placed on (1) maintenance of independence of mind and body, (2) keeping the elderly patient out of hospitals as much as possible, (3) psychologic aspects involved in geriatric nursing, and (4) acceptance of team concept by personnel in treatment of the aged in hospital. The author deplores the tendency of hospital personnel to regard nursing of the aged as less desirable duty than caring for younger patients, thus causing the elderly to be shunted aside with a minimum of care. Several abbreviations and terms are employed that are not in common usage in hospitals in the United States, such as S. R. N., S. E. A. N., almoner, frail ambulant, and long stay annexes.

This book is not suitable for a reference handbook in clinical teaching in military hospitals. Although it brings out many important aspects of the care of the aged sick, it is both too elementary for the trained professional nurse and too complicated for unskilled auxiliary hospital personnel. It would be useful, however, to the student nurse as additional reading material in her first year of training. It also would be valuable to those primarily interested in specializing in geriatric nursing. — D. KUDRITZEN, Lt. (NC) USN

REGIONAL BLOCK ANALGESIA. A Handbook for the Clinical Practitioner. Edited and Surveilled by Donald C. McMorris. M. D. 373 pages. Illustrated. Churchill Livingstone, Springfield, Ill. 1953. Pp. \$11.

According to the author, this book presents a concise outline of the everyday phase of regional analgesia in the clinical practice of medicine and surgery and is intended for the beginner. In view of this stated purpose, it is difficult to understand why the author includes techniques which are definitely not for the beginner or even for the oc-

casional anesthetist. As an example there is a chapter on spinal absolute alcohol block which the author concludes with the statement that spinal alcohol injections are often unsatisfactory (and) should be limited to larger institutions or specialists whose reputation can compensate for poor results.

The book is profusely illustrated with excellent photographs and drawings but the high gloss paper necessary for their clear reproduction makes reading difficult. This book will be a valuable aid in teaching but it should not be used without supervision. The part time anesthetist will find the book's illustrations of great help if he is not tempted by them to overreach his limitations.

—D E MacQUIGG Maj MC USA

PEDIATRIC GYNECOLOGY With Sections on Urology and Proctology by Goodrich C. Schauffle M D 3d edition 318 pages illustrated The Year Book Publishers Inc Chicago Ill 1953 Price \$7.50

In this third edition of *Pediatric Gynecology* the author presents a clear and simple discussion of material that most pediatric and gynecologic texts cover in a hazy and fragmentary manner. The subject matter is divided into fourteen chapters. In these the author has organized his material well and presents it with a definite sense of humor in an easily read style. He describes successively the methods of gynecologic examination, the genitalia, diagnosis and treatment of vaginitis, disorders of adolescence, female urology, proctology, and the medicolegal aspects of pediatric urology.

Because of its practical nature this book should be of definite interest both to general practitioners and to pediatricians.

—A T HENDERSON Lt Comdr (MC) USN

GOURMET COOKING FOR CARDIAC DIETS by Florence Field 350 pages decorations by Vee Guthrie The World Publishing Co Cleveland Ohio 1953 Price \$3.50

This book provides recipes and valuable information for planning, preparing, and serving palatable food for cardiac patients on restricted diets. Detailed guidance in the management of low-calorie, sodium-restricted, low fat, low cholesterol, and low purine diets is outlined. Included in the book are many diet lists, menu patterns, household hints, charts, and tables in addition to recipes for the preparation of diet foods. One chapter of the book is devoted to reducing diets and is valuable not only to the cardiac patient but also to any person who wishes to lose weight.

Because the author maintains that food prepared for cardiac patients can taste good and can be enjoyed with slight modifications by all members of the family, the patient who reads and uses this book will find it an easy and practicable guide in following the doctor's diet prescription.

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NARCOTICS AND NARCOTIC ADDICTION by D v d W M u r Ph D
Prof f E g l i h d t h H u m t U t y f L I l
L e t u r N t c A d d t d C m n a l A g t S t h P l
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\$3 75

ANTISEPTICS DISINFECTANTS FUNGICIDES AND CHEMICAL AND PHYSICAL STERILIZATION edited by George F. Reddish Ph D Sc D (Hon.) St Louis College of Pharmacy and Allied Sciences and Lambert Pharmacal Company Division of The Lambert Company St Louis Mo 841 pages 71 illustrations 130 tables Lea & Febiger Philadelphia Pa 1954 Price \$15

INTERNAL MEDICINE IN DENTAL PRACTICE by Bernard J. Connor A B M D F A C P Late Associate in Medicine Schools of Medicine and Dentistry in the University of Pennsylvania Leon H. Collins Jr A B M D F A C P F C C P Associate in Medicine Schools of Medicine and Dentistry of the University of Pennsylvania Member of the Chest Section Hospital of the University of Pennsylvania Visiting Physician Philadelphia General Hospital Consulting Physician United States Veterans Hospital Coatesville and Attending Physician United States Veterans Hospital Philadelphia Colonel U S Army Medical Reserve Corps and Martin P. Crane B S M D Sc D (Hon.) Chief Physician The Misericordia Hospital Philadelphia Reserve Consultant in Medicine to the U S Naval Hospital Philadelphia Capt in Medical Corps United States Naval Reserve 4th edition thoroughly revised 563 pages 86 illustrations and 30 in color on 6 plates Lea & Febiger Philadelphia Pa 1954 Price \$7.50

RH HR BLOOD TYPES Applications in Clinical and Legal Medicine and Anthropology Selected Articles in Immunohematology by Alexander S. Wierer M D F A C P Senior Serologist to the Office of the Chief Medical Examiner of New York City Assistant Professor in the Department of Forensic Medicine of the New York University Postgraduate Medical School Attending Immunohematologist to the Jewish Hospital of Brooklyn Attending Transfusionist to the Adelphi Hospital of Brooklyn 763 pages illustrated Grune & Stratton Inc New York N Y 1954 Price \$11.50

COLD INJURY Transactions of the Second Conference November 20-21 1952 New York N Y edited by M. Irene Ferrer Assistant Professor of Clinical Medicine Columbia University College of Physicians and Surgeons 242 pages illustrated Sponsored by the Josiah Macy Jr Foundation New York N Y Printed by Corlies Macy & Co Inc New York N Y Price \$4

NERVE IMPULSE Transactions of the Fourth Conference March 4 5 and 6 1953 Princeton N J edited by David Nachmansohn M D Associate Professor of Neurology Columbia University College of Physicians and Surgeons New York N Y 224 pages illustrated Sponsored by the Josiah Macy Jr Foundation New York N Y 1954 Printed by Progress Associates Caldwell N J Price \$4

EXPERT COMMITTEE ON LEPROSY First Report World Health Organization Technical Report Series No 71 28 pages World Health Organization Geneva Switzerland publisher 1953 Price \$0.20

EXPERT COMMITTEE ON BILHARZIASIS First Report World Health Organization Technical Report Series No 65 45 pages World Health Organization Geneva Switzerland publisher 1953 Price \$0.30

REPORT OF WORKING GROUP ON HUMAN BEHAVIOR UNDER CONDITIONS OF MILITARY SERVICE A Joint Project of The Research and Development Board and the Personnel Policy Board in the Office of the Secretary of Defense Prepared by Sidney Adams Ph D Jack Puel Colonel USAF (MSC) Ph D Gordon Barclay Colonel AGC, USA Ed D and Percival Eaton M. Dowell Captain US Coast Guard 426 pages Printed at U S Government Printing Office Washington D C. 1953

BREAKING PATTERNS OF DEFEAT Th Eff t Re d j tme t f th St k
 P nal ty by R b d L J k ns M D Ch f f P y hi tr c R
 ch P ychi try d N ur l gy S c V t Adm trat
 W h gt n D C 270 pag llust t d J B L pp ott C Ph la
 d lph P p bl h 1954 P \$6 75

MUSIC THERAPY d t d by Edw d P d l ky M D D p tme t f P ychi
 at y K g C unty H pit l Bookly N Y 335 pag ll trat d
 Ph l ph l Library N w Y k N Y 1954 P \$6

COAL TAR AND CUTANEOUS CARCINOGENESIS IN INDUSTRY by F k
 C C mb s M D P f of De mat l gy d Syph l logy N w Y k
 U y P t G dua M d cal S h l D ct f D mat l gy d
 Syph l l gy B ll H pital N w Y k N Y Ame L ctur
 S P bl t Numbe 186 A M g ph Am L tur
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 Arb M h 76 pag ll trat d Ch l C Th ma P bl h
 Sp ngf ld Ill 1954 P \$2 75

PHARMACOLOGY by J H G dd m S D F R S M R C S L R C P
 P f f Ph ma ol gy th U ty f Ed b gh 4 h d t o
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FOREWORD

The *United States Army Medical Journal* the medium for the dissemination of information for the benefit of the Department of Defense. The *Journal* is published by the Department of Defense, Office of the Surgeon General, and the Army Medical Department. The *Journal* is published by the Department of Defense, Office of the Surgeon General, and the Army Medical Department.

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Monthly Message

Inasmuch as the article I wrote for this month's number of the *Journal* is too long for its usual place and will be found on page 713 I therefore offer for your earnest thought and concern one of the famous passages of literature concerning the physician which comes from the Book of Ecclesiasticus 38th chapter and should be well known to all

1 Honor the physician for the need thou hast of him for the most High hath created him

2 For all healing is from God and he shall receive gifts of the king

3 The skill of the physician shall lift up his head and in the sight of great men he shall be praised

4 The most High hath created medicine out of the earth and a wise man will not abhor them

Frank B Berry

FRANK B BERRY M D
Assistant Secretary of Defense
(Health and Medical)

PREDICTION OF IMMEDIATE PSYCHIATRIC BREAKDOWN IN MILITARY SERVICE

DAVID A HAMBURG *Captain, MC USA*
T GRADY BASKIN *Captain, MC USA*
ANTHONY C TUCKER *Colonel MSC USA*

SINCE the beginning of World War II, a drastic reorientation has occurred in psychiatric screening of candidates for military service. Early in World War II, the primary orientation was toward the detection and elimination of the majority of potential psychiatric casualties prior to induction.^{1,2} Experience soon showed that this goal was unattainable, because large numbers of psychiatric casualties occurred in spite of high rejection rates.^{1,3} Postwar studies have produced abundant evidence that with our present knowledge, attempts to screen out any large proportion of potential psychiatric casualties are not likely to be effective.³⁻⁵ These findings are especially significant because there is a relative manpower shortage which appears likely to continue for a long time to come.

When it became apparent that the high rejection rates of World War II were achieving less than expected in the way of preventing psychiatric breakdown and that many potentially useful soldiers were being lost to the military service,⁶⁻⁷ a sharp reaction occurred which led to the dictum, "Performance is the only test." This viewpoint, in its most extreme form, has sometimes led to the conclusion that psychiatric screening should be abandoned altogether, and that those who break down should be quickly separated from the service. For this and other reasons, rejection on psychiatric grounds has largely disappeared in some parts of the country.¹ There is no doubt that in recent years the trend has been toward lower rejection rates, and broadening of the interpretation of what constitutes acceptability for military service.^{8,10} However, some psychiatric screening has continued. In general, the object of this screening has been only the exclusion of "the obviously unfit,"⁸ or "grossly incapacitated."¹²

This seems to be a logical outcome of research in this field during and since World War II but there is still considerable

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confusion and difference of opinion in applying even such a simple and gross criterion as "obviously unfit." This is reflected by the marked variability of rejection rates in different parts of the country.¹ Furthermore there is considerable doubt if there is any correlation between the rejection rate and the neuropsychiatric casualty rate in any given area. Is the number of men breaking down in service actually decreased by screening procedures?² It is a widespread clinical impression that various military hospitals have many psychiatric patients who became ill soon after entry in service. Frequently from his history there is substantial reason to believe that such a patient showed gross indications of severe impairment at the time of induction and might well have been eliminated by any reasonably effective screening procedure. While their number is small in terms of the absolute size of the army in some parts of the country they constitute an important part of the psychiatric patient load of the Army Medical Service.

A logical first step therefore in current research on psychiatric screening is to determine whether or not effective screening procedures can be devised for this group of men who break down almost immediately on entrance into service, perform no effective service, often require considerable hospitalization and sometimes become long term psychiatric casualties under Veterans Administration or civilian care. To state the proposition in a somewhat oversimplified form, if any group of potential psychiatric casualties can be accurately screened this group should be the one. If this group cannot be screened, accurate psychiatric screening is probably not possible in the light of present knowledge.

MATERIAL AND METHODS

An attempt was made to differentiate the "immediate breakdown" group from men who broke down later in their military careers. Ideally, such a differentiation should be made predictively, with the data collected on a large scale prior to induction and a subsequent long term follow up. Before undertaking any such extensive project we surveyed some readily available clinical records in a retrospective study designed to provide some evidence for simple, clear cut criteria which might prove to be the most effective predictors of immediate breakdown.

The two groups to be differentiated were defined as follows. "Immediate breakdowns" were patients admitted to a psychiatric ward within 30 days after entry into the military service and "late breakdown" were patients admitted to a psychiatric ward after a year or more of uninterrupted military service. In each group a random sample was obtained of admissions to the neuro-

psychiatric service of the hospital during the period from 1950 to 1952. Ninety six cases in the immediate breakdown group, and 66 in the late breakdown group were selected for study. About two thirds of the immediate breakdown group were Air Force personnel, while four fifths of the late breakdown group were from the Army. The large proportion of airmen is accounted for by the fact that men entering the Air Force received basic training at nearby Lackland Air Force Base. Within each group, half the patients were from the closed psychiatric section and half from the open psychiatric section.

The average age of the immediate breakdown group was 20 years, and of the late breakdown group 27 years. The average lengths of service were 16 days and six and one-half years, respectively. The clinical records of each patient reviewed included the following:

- 1 The final clinical abstract of the psychiatrist, written immediately prior to the patient's discharge from the hospital which included a summary of the patient's chart, and current and previous hospitalizations.

- 2 The original social histories in about 75 percent of the cases, obtained by psychiatric social workers from the patient, members of his military unit, and family (when available).

- 3 American Red Cross histories in 25 percent of the immediate group, and 15 percent of the late group obtained in the home community of the patients. From all of these sources of data certain items of information were extracted and tabulated.

The two groups shared the following characteristics: (1) home section of country (all parts represented about equally, except for Pacific Coast), (2) rural or urban background (about equally divided in each group), (3) economic status, and (4) place in family order of siblings. The only notable difference in any of these respects was that 57 percent of the immediate group and 29 percent of the late group were in the "poor to-fair" economic category.

RESULTS

Comparisons of the preservice record, diagnosis and disposition of the immediate and late breakdown groups are shown in tables 1 and 2. The sharpest differentiation occurred on several items of preservice behavior, which in most cases mainly involved functional impairment sometime during the three years just prior to induction.

In the immediate breakdown group there was a much higher incidence of (1) previous similar illness, (2) similar illness of severity equal to or greater than present illness, (3) hospitaliza-

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tion on psychiatric basis (4) extremely poor work record, (5) failure in one or more grades in school, (6) other major school difficulty, (7) severe interference with both school and work due to subjective distress, and (8) poor family adjustment.

TABLE 2 *Comparison of diagnosis and disposition of immediate and late breakdown groups*

Type	Immediate breakdown group (96 patients) (percent)	Late breakdown group (66 patients) (percent)
Intelligence below average	13	5
Diagnosis		
Psychotic disorders without known organic cause	28	36
Psychiatric disorders with demonstrable physical cause	3	5
Psychoneurotic disorders	34	33
Character and behavior disorders	34	21
No psychiatric diagnosis justified	1	5
Disposition		
Duty	9	42
Administrative separation	62	9
Medical separation	26	42
Other	3	7

To minimize difficulty in evaluating each of these items standards were made relatively simple. They included

1 *Previous similar illness* Patient's current discomfort and interference with usual activities similar in most respects to an earlier distress for which he had sought medical help

2 *Equal or greater severity* The previous similar illness at least as severe as the current one, in terms of discomfort and functional impairment.

3 *Psychiatric hospitalization* Admission to a psychiatric hospital or psychiatric service of a general hospital or for a "nervous breakdown"

4 *Severe work impairment* Any one or combination of

(a) Failure to hold a job for more than a few months (excepting jobs interrupted by induction and excepting the first year after leaving school)

- (b) Repeated loss of days or weeks from job and interference with work performance because of subjective distress attitude toward work or interpersonal difficulties
- (c) Repeatedly discharged from jobs (for whatever reason)
- (d) Unable to work except in the employ of a member of the family (that is must include actual failure outside family)
- (e) Able to work only part time (that is must include failure at full time work does not include those still in school)

5 *School failure* Failed one or more grades in school

6 *Major school difficulty* Includes two or more of the following

- (a) Left school because of personal difficulties
- (b) Repeatedly lost time (days or weeks)
- (c) Occurrence of multiple or severe disciplinary episodes
- (d) Consistent prominent difficulties in interpersonal relationships (such as frequent fights isolation from others)

7 *Interference with school and work due to subjective distress* Any one or a combination of

- (a) Much loss of time (days or weeks)
- (b) Periods of gross impairment in usual ability to handle assigned tasks
- (c) Feeling of general incapacitation

8 *Poor family adjustment* Any one or a combination of the following

- (a) Ran away from home
- (b) Quarreled incessantly
- (c) Chronically refused to co-operate
- (d) Extremely dependent.

How well can patients in the immediate and late groups be discriminated? Table 3 gives the results of scoring each man on the basis of five of the most important items of his previous behavior. For example a cutting score of 2 that is having two or more of these types of previous failures would involve 6 percent of the immediate group and only six percent of the late group. Or a cutting score of 3 would include 38 percent of the immediate group and three percent of the late group. The goal would be to reject for enlistment the group with characteristics which would include a reasonable percentage of the immediate

group while including only an extremely small percentage of the late group. Much further research, however, is needed before criteria of this kind could be applied in practice.

TABLE 3 *Results of individual scoring on the basis of one or more characteristics*

Number of characteristics	Patients			
	Late group		Immediate group	
	Number	Percent	Number	Percent
5			5	5
4			12	18
3	2	3	19	38
2	2	6	24	63
1	13	26	23	86
0	49	100	13	100
Total	66		96	

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ACCURACY OF FINDINGS

Because these figures were based on hospital clinical records the information is neither complete nor entirely accurate. Though relevant information sometimes was not in the clinical record the most pertinent items in this study are standard questions covered in almost every psychiatric interview or social history. These items involve relatively gross, obvious aspects of the individual's life and therefore can hardly escape notice.

In those cases in which corrective cross check of information from outside sources was not available the question arises as to whether or not the information in the clinical records was distorted by the patients. For example, the number of past major difficulties in the "immediate" group might be artificially increased by patients who take the attitude, "I've been so sick all my life that the Army never should have taken me in." On the other hand the number of similar difficulties in this same group might be artificially decreased by the commonly encountered attitude "The Army has ruined me. I never had so much trouble before." Another prominent question in this regard is whether or not the incidence of major preservice difficulty might be artificially decreased in the late breakdown group by conscious or

unconscious efforts to establish that the disability is service connected

The number of items might be distorted by some basic differences in the orientation of the professional staff preparing the clinical records based on a difference in the two groups: men in the immediate group had given no effective service whereas men in the late group were often looked on as real soldiers who had given effective service previously. These differences in orientation toward the two groups inevitably led to some difference in emphasis in the clinical records. The items most pertinent to this study however are likely to be included in the record regardless of the physician's training or the type of disposition. In order to check on some of these possible sources of distortion the group of patients on whom Red Cross histories were available were tabulated separately on the key items. Although this double check group was small from a statistical viewpoint the percentage distribution of positive and negative findings was comparable to the distribution found in the total group. These figures are included in table 1.

Every effort was made to handle the data in the same way for both groups and to apply the standards rigorously and equally. After the initial scoring one extra "weeding out" check was made on the immediate breakdown group to find any instance in which a questionable item had been scored as positive (that is severe impairment or failure). All such items were changed to negative. The data reported give a roughly accurate quantitative estimate of the differences between the two groups on the items recorded. It is probable that if complete information on every patient was available from all sources the number of most relevant items would be somewhat higher in both groups but that the differences between the two groups would remain about the same.

POSSIBLE PREDICTIVE VALUE IN SCREENING

In this study the items which seem most predictive of immediate breakdown are previous similar illness, psychiatric hospitalization, school and work failures, and severe disruption of recent family relationships. It is possible that civil disciplinary episodes and confinement might also be useful but our study does not clarify this point because the records contained little information of this type. If a man in civilian life fails when given any substantial responsibility and needs constant protection there is a high probability that he will do likewise in the military service. Several follow up studies on psychiatric screening seem to give some evidence in support of this proposition.¹¹

The question arises whether such criteria for screening ought to be based on psychiatric diagnosis or on functional impair-

ment, particularly because some studies give slight encouragement to the view that the former (when restricted to broad categories such as psychosis and overt neurosis) may be of predictive value for breakdown in service.^{12 25} When carefully applied, it is very probable that psychiatric diagnosis coincides to a large extent with functional impairment. We believe, however, that functional impairment is generally preferable for this purpose for the following reasons

1. This study provides little evidence of predictive value in diagnoses. Because this is a retrospective study, too much weight cannot be attached to this point. It is conceivable that preinduction diagnoses might give very different results.

2. The type of items we have used in dealing with functional impairment lend themselves to relatively simple definitions which can be readily understood and widely used. They tend to reduce complex judgments, differences of interpretation, and theoretic biases.

3. There is still considerable difference of opinion and usage among psychiatrists of diagnostic categories. These involve more complex judgments and abstractions which are relatively difficult to define. Furthermore, penetrating interviews may reveal symptoms (such as anxiety, depressive trends, and compulsive behavior) which might justify a psychiatric diagnosis in a large percentage of the total population, and it probably was such a process which led to the extraordinarily high diagnosis and rejection rates in World War II.

4. It is a common clinical observation that many persons with symptoms sufficient to justify a psychiatric diagnosis nevertheless perform effectively in society and sometimes make remarkable achievements. From the viewpoint of the needs of the military service, the essential consideration is not the presence or absence of symptoms justifying a diagnosis but whether or not the individual can function effectively in spite of his symptoms.

ADDITIONAL STUDIES NEEDED

These findings, considered in light of the trend of postwar evidence on psychiatric screening, emphasize the need for intensive study of this immediate breakdown group. The study presented should be repeated in various Army areas. The focus might be sharpened even further by considering only closed ward patients, because these represent the most severe and least rehabilitable patients. As an additional check, it would be useful to have information from parents, employers, family physician, and schools in all cases.

If several such retrospective studies were as indicative as ours a predictive study might then be made in connection with the selective service procedures so that information would routinely be obtained from a large number of inductees who would then be observed during basic training to determine those who broke down immediately and were discharged from service. In this way effective criteria for prediction of immediate break down might be established or else it might be determined systematically that even this extreme group could not be effectively and economically screened in light of present knowledge.

This study has not explored the potentially important problem of motivation for military service and related psychodynamic factors even at a conscious level. Hospital records contain little information that is helpful in evaluating the motivational factors at the time of entry into service. This is a major research problem in itself but two points should be noted. (1) Motivation for military service is probably a complex matter involving both conscious and unconscious attitudes and in many cases is not accurately reflected by the patient's statement of desire or lack of desire to serve and (2) it is probably not a static part of the personality but rather a changing, developing orientation which is considerably influenced by one's assignment, personal relationships, leadership, group identification and physical hardship.

Research on psychiatric screening at the Army Medical Service Graduate School in collaboration with other installations is directed toward establishing more accurate and useful criteria which might ultimately be used first to sharpen the focus of the screening interviews. These must be brief and any information which steers the interviewer toward those areas that are most likely to be predictive of early breakdown seems worthwhile. Second, these criteria could be the basis for the development of a screening device for use prior to interview to select those men who are in the doubtful category and require more detailed interviewing. These studies also have a bearing on broader problems of adjustment. Screening is only one part of the total manpower problem. Effective use of men after they have entered military service is of primary importance.³

SUMMARY

In recent years the goal of psychiatric screening for the armed services has been shifted from exclusion of potential psychiatric casualties to the elimination only of those who are psychiatrically incapacitated in civilian life. This study has attempted to provide evidence on the degree and nature of pre-service functional impairment in a group of men who required psychiatric hospitalization within 30 days after entry into military service. Ninety six such patients were compared with 66 others

who served uninterruptedly for a year or more prior to hospitalization. There was a much higher incidence of severe preservice functional impairment in the immediate breakdown group than in the late breakdown group. This impairment mainly involved previous illness, hospitalization, work record, school record and adjustment to family. This suggests that the men who break down immediately after entering service provide a logical focus for psychiatric screening research directed toward more accurate preservice prediction.

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ARTHROTOMY OF THE KNEE JOINT

A Statistical Analysis of 260 Cases

VINCENT E WAGNER *Commander (MC) USN*

THIS article is a comparative study of the symptoms and operative findings in 260 consecutive arthrotomies performed by 35 different surgeons over a four year period in a naval hospital. The patients in this study were selected from the military age group (table 1), and included 29 veterans

TABLE 1 *Age distribution of patients studied*

Age of patients (years)	17-20	21-30	31-40	Over 41
Number of cases	82	139	26	13
Percent of total (260)	32	53	10	5

MacAusland¹ reporting 388 cases among civilians found the majority of patients in the 21 to 30-year age group (32 percent) the next largest number in the 11 to 20-year age group (23 percent), and the third largest in the 31 to 40 year age group

TABLE 2 *Types of injury sustained*

Type of injury	200 meniscectomies (percent)	60 other arthrotomies (percent)
Football	28.5	8
Twisting (other sport)	24.5	13
Direct blow	10.5	27
Fall	9.5	17
Rising from squat	9.5	0
Other	15.0	18
No history of injury	2.5	17

(17 percent). Sixty-five percent of his patients were males. Bonar² reporting 200 meniscectomies among miners, found 53.5

¹F. M. U. S. N. I. H. Pitt. O. kland. Calif. Comd. W. gner is now at St. Charl. s.
H. p. I. nd Orth. p. d. c. Clin. c. B. ooklyn. N. Y.

percent of the patients under the age of 35. The cases presented here comprise 200 meniscectomies and 60 other arthrotomies in which the meniscus was not removed. A history of injury was obtained in 97.5 percent of the first group and 83 percent of the second group (table 2).

Athletic injury was the cause of 53 percent of the meniscectomies while a direct blow or fall accounted for 44 percent of the other arthrotomies. In this study meniscus tears were usually the result of an athletic injury whereas other types of lesion generally followed a direct blow or fall. Duthie and MacLeod found that 60 percent of their cases dated from a football injury. MacAusland reported that 80 percent of his patients gave a history of injury. 62 percent were miners and the next largest group were athletes.

SYMPTOMS AND PHYSICAL FINDINGS

The symptoms and physical findings presented by the two groups studied here are given in table 3.

TABLE 3 Symptom and physical findings

Symptom and physical findings	200 meniscectomies (percent)	60 other arthrotomies (percent)
Pain	85.0	70
Swelling	68.0	55
Locking	51.0	23
Atrophy of quadriceps	38.0	33
Effusion	35.5	30
Flexion limitation	30.0	28
Muscle wasting	35.0	8
Effusion	26.0	23
Clicking	22.5	17
Giving way	19.5	23
Leg muscle wasting	19.5	27
Positive Lachman's test	9.0	20
Stiffness	5.5	13
Rotational laxity	9.5	61
Popliteal lump	9.5	0
Loss of motion	70 percent	40 percent

Pain was the most frequently recorded symptom. In the absence of fever, increased sedimentation rate and systemic disease, pain was an indication of internal derangement. Its location was important. When the pain was at the joint line, either at the anterior edge of the medial collateral ligament or under the ligament, it usually indicated a tear in the medial meniscus, when at the attachment of the ligament, a tear of the ligament and when caused by forcing a locked knee or by the McMurray maneuver, an injury of a meniscus.

The next most frequent and important finding was swelling. This nearly always accompanied the original injury. A history of recurrent swelling strengthened the supposition that internal derangement was present. Its absence was strong evidence against internal derangement. Some chronic cases reached a stage of locking without swelling, but had a history of swelling.

Locking, when present and not caused by joint mice, confirmed the diagnosis of meniscus injury, especially if all the other symptoms so far mentioned were found. It was important to inquire carefully into the condition in order to give it credence as true locking: *i. e.* did it occur while rising from a squat, during some athletic twisting of the knee, or stepping down from a curb, and how was it relieved? Many patients learned how to release a locked knee by manipulating it themselves. Some could not relieve it and were admitted with a bent knee. In others locking was due to the trapping of a joint mouse. The occurrence of such locking did not affect the treatment, as patients with lesions of the meniscus and those with joint mice both required arthrotomy. All but two of our patients with a history of locking for whom arthrotomy was performed without removal of a meniscus, had joint mice. It was important to rule out slipping of the biceps femoris tendon, crepitation of the patella and "riding off" an otherwise normal cartilage (not painful and unaccompanied by swelling or a history of swelling).

Atrophy of the quadriceps femoris muscle varied from one half inch to two and one half inches and was objective evidence of limited function of the knee. Its absence ruled out arthrotomy, especially if other important symptoms were also lacking. Limited extension and flexion, when forced, often demonstrated characteristic springiness and pain, and favored the diagnosis of a meniscus lesion.

The McMurray maneuver, when positive, was characteristic of a meniscus lesion and helped to distinguish it from other internal derangements. It also helped to indicate the part of the cartilage torn. The lesion was posterior when the click occurred during acute flexion and more anterior if it occurred as the knee was

extended. This sign strongly supported a diagnosis of meniscus lesion as it occurred four times more frequently here than in the arthrotomy group without meniscectomy.

The occurrence of effusion, clicking, and giving way was about equal in the two groups, but patellar grating was more frequent in the arthrotomy group without meniscectomy, as was laxity of the ligaments. Laxity of the anterior cruciate ligament was three times as frequent as that of other ligaments among the 19.5 percent of the 200 meniscectomies with ligament laxity. A persistent palpable lump at the lateral side of the joint was indicative of a cyst of the lateral meniscus. Joint mice, when palpated, were movable and disappeared within the joint. The roentgenograms were negative in 90.5 percent of the group with meniscectomies and positive in 61 percent of the other group.

PATHOLOGIC FINDINGS

The pathologic findings in the menisci removed are listed in table 4. The percentage of bucket-handle tears found (51.5 percent) was practically the same as that reported by Adamson. The percentage of normal cartilages removed (7 percent) was identical with that reported by Smillie. Of the meniscectomies, 84 percent were medial and 16 percent lateral, a finding comparable to those of Bonar and Adamson. Smillie, however, found a considerably higher percentage of lateral cartilage injuries (36 percent).

TABLE 4. Pathologic findings in menisci removed

Pathologic findings	200
	m c t m (p c t)
Total	
Bucket-handle	51.5
Partial horizontal	13.5
Anterior horn	8.5
Partial beak	4.5
Transverse	1.0
Partial longitudinal	1.0
Displaced longitudinal	0.5
Unilateral	6.5
Cyst (lateral, medial, lateral cartilage)	3.5
Peripatellar debris	2.5
Normal cartilage removed	7.0

There was one case in this series where a "bucket handle" tear of a lateral cartilage was discovered after a normal medial meniscus had been removed, so that both cartilages were removed in one operation. In another case both menisci were removed at separate operations. It was more difficult to determine preoperatively that a lesion was of the lateral cartilage. Smillie stated that in the lateral meniscus lesions with symptoms referred to the medial side of the joint the symptoms are less positive and the pain and tenderness elicited by manipulation is on the side of the lesion. Pathologic findings in the two groups other than lesions of menisci are given in table 5.

TABLE 5 *Pathologic findings other than lesions of menisci*

Pathologic findings	200 meniscectomies (per cent)	60 other arthrotomies (percent)
Ligament tear		
Anterior cruciate	10.5	15.0
Medial collateral	3.5	6.7
Lateral collateral	0.0	1.7
Posterior cruciate	0.0	3.3
Loose bodies in joint	7.5	48.0
Osteochondritis	16.5	44.7
Patella alone	6.5	11.7
Patella and medial condyle	5.0	10.0
Medial condyle alone	5.0	23.0
Thickened synovium	4.5	23.0
Arthritis with pannus formation	1.0	1.8
Villous synovitis	0.0	1.7

There was a higher percentage of ligament tears, joint mice, chondromalacia, and thickened synovium in the group without meniscectomy. Chondromalacia of the patella occurred in 21.7 percent of the group without meniscectomy and in 11.5 percent in the group with meniscectomy. Halderman and Soto-Hall⁴ reported chondromalacia of the patella in only 10 percent of 289 arthrotomies. There was little difference in the involvement of the right and left knees. In both groups the right knee was involved in 52 percent and the left knee in 48 percent. The symptoms presented and the pathologic findings were usually consistent with the result that the preoperative diagnosis was accurate in 93 percent of the cases, as proved by the pathologic condition found. A typical case of lesion of the meniscus had

a history of athletic injury to the knee pain localized at the joint line and immediate swelling or recurrent episodes of swelling and locking It revealed atrophy of the quadriceps limitation of flexion and extension a positive McMurray sign and negative roentgenographic findings Other forms of internal derangement usually had a history of direct blow to the knee pain and swelling They demonstrated atrophy of the quadriceps limitation of flexion and extension giving way laxity of ligaments patellar grating stiffness presence of loose bodies and positive roentgenographic evidence of loose bodies and osteochondritis

The percentage of active duty patients with meniscectomies who returned to duty was 89 with other arthrotomies 77 This is roughly comparable to the results reported by Duthie and MacLeod Bonar and MacAusland

DURATION OF CONVALESCENCE

The average length of convalescence in the hospital was 71 postoperative days for the patients with meniscectomies and 85 for those with other arthrotomies Military personnel were retained in the hospital until fit for duty or given a medical discharge from the service Veterans were allowed to convalesce at home (table 6)

TABLE 6 Duration of convalescence

Type of surgery	Number of patients	Average number of postoperative hospital days
Meniscectomy	200	71
Arthrotomy	22	28
Returned to duty	158	69
Medically retired	20	137
Other arthrotomy	60	85
Arthrotomy	7	31
Returned to duty	41	93
Medically retired	12	89

Table 7 presents a comparison of the duration of symptoms before operation with the number of postoperative hospital days for convalescence

In the 158 patients with meniscectomies who were returned to duty the duration of symptoms before operation had no appreciable effect on the number of postoperative hospital days

TABLE 7 Duration of symptoms before operation compared with the average number of postoperative hospital days for convalescence

Duration of symptoms (months)	178 minor cectomies				53 arthrotomies			
	Number of cases	Returned to duty (postoperative days)	Number of cases	Medically retired (postoperative days)	Number of cases	Returned to duty (postoperative days)	Number of cases	Medically retired (postoperative days)
1	24	76	1	117	12	98	0	0
2	14	60	0	0	3	136	0	0
3-6	15	87	1	83	6	52	1	26
7-12	19	60	2	180	2	64	1	93
13-24	23	69	2	200	3	59	2	89
Over 24	63	66	14	135	15	109	8	97

Verbal statements of the patients excluded because of the valescence at home

TABLE 8 Average number / po t o p e r a t i v e h o s p i t a l d a y r e q u i r e d b y a g e r p

Age group (year)	178 m				53 h			
	N m b f	R u r d y (po p e r a d y)	N m b f	M d lly d (po p d y)	N m b f	R u r d y (po p d y)	N m b f	M d lly d (po p d y)
17 20	52	63	7	133	19	80	4	79
21 30	87	73	9	153	21	100	7	93
31 40	1	63	3	113	1	180	0	0
41 50	7	67	1	83	0	0	1	100
All r	158	69	20	137	41	93	12	89
	l u d d b e	m o	f h	a l	n c w	h m		

Bonar reported a similar finding. In this series, however, the prognosis was better when the symptoms were of short duration. Of those medically retired, 69 percent had had symptoms for over two years whereas of those returned to duty, only 39 percent had had symptoms for over two years.

FACTORS AFFECTING LENGTH OF CONVALESCENT TIME

Table 8 shows the average number of postoperative hospital days required by age groups. Those under age 21 averaged fewer hospital postoperative days. Naylor⁷ stated that the best results were obtained in early cases. Bonar found the young miner made a quicker recovery than the older one.

TABLE 9 *Average number of postoperative hospital days with respect to types of incision and operating time*

Type of incision	Average number of postoperative days	
	153 meniscectomies	41 other arthrotomies
Fisher	55	—
Short parapatellar	56	83
Hockey tick	57	98
Transverse (6 cases)	66	—
Utility	91	127
<i>Duration of operation</i>		
Less than 60 minutes	63	80
More than 60 minutes	85	100

Excluded from statistics who could not walk

In the cases studied here, there were 22 patients with meniscectomies (including three veterans and three who had been medically retired) with two incisions on the same knee. Their average postoperative hospital stay was 83 days, as compared with the general average of 71 days. There were five patients with other arthrotomies (including two veterans and one medically retired) who had two incisions in the same knee. Their average postoperative hospital stay was 85 days, which is identical with the general average. Patients with meniscectomies who had had two incisions were slower to convalesce. There were nine patients with meniscectomies who had two operations on the

same knee (including two veterans and four medically retired) Their postoperative days averaged 97 as compared with the general average of 71 There were 11 patients with other arthrotomies (including two veterans and two medically retired) who had two operations on the same knee Their average postoperative days were 120 as compared with the general average of 85 Patients who had two operations on the same knee were slower to convalesce from the second operation

Table 9 indicates the average number of postoperative hospital days as compared with the type of incision made and the duration of the operation The number of postoperative hospital days was increased when the utility incision was used and when the operating time exceeded one hour In 32 cases with removal of the lateral meniscus the average postoperative days were 87 which was greater than the general average of 71 days for the group with meniscectomies

SUMMARY AND CONCLUSIONS

In 900 meniscectomies and 60 other arthrotomies tears of the semilunar cartilage in naval personnel occurred most frequently as a result of athletic injury and in the younger age group

Typical findings for injury of the meniscus were pain localized at the joint line immediate swelling or recurrent episodes of swelling locking atrophy of the quadriceps limitation of flexion and extension a positive McMurray sign and negative roentgenographic findings

Typical findings for other internal derangement without injury to the meniscus were a direct blow to the knee pain and swelling atrophy of the quadriceps limitation of flexion and extension giving way laxity of ligaments patellar grating stiffness presence of loose bodies and positive roentgenographic evidence

Of the patients having meniscectomies 51.5 percent had bucket-handle tears Normal cartilages removed constituted seven percent Tears of the ligament were present in 14 percent of these patients and 26.7 percent of those having other arthrotomies Chondromalacia was present in 16.5 percent of the patients with meniscectomies and 44.7 percent of those with other arthrotomies

The postoperative hospital stay was 71 days for the group with meniscectomies and 85 days for the group with other arthrotomies The postoperative days were increased in the following situations two incisions on the same knee two operations on the same knee performed on separate occasions the utility incision and when the operating time was over one hour They were decreased in the youngest age group

Eighty nine percent of the active duty patients with meniscectomies and 77 percent of those with other arthrotomies returned to duty. The prognosis was better when the symptoms were of less than two years duration.

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Cardiac Asthma

The word asthma was first used by Hippocrates to denote hurried breathing and for some time it was considered synonymous with shortness of breath. In 1819 Laennec the discoverer of auscultation originated the concept that asthma is distinct from shortness of breath and represents a definite entity characterized by paroxysmal dyspnea without demonstrable associated organic lesions. In 1832 however Hope called attention to the fact that there are several varieties of asthma of which organic disease of the heart constitutes one and that in all instances bronchospasm exists. He recognized the difficulty of distinguishing the asthma produced by disease of the lungs from that due to heart ailments and coined the term cardiac asthma for the latter. Subsequently cardiac asthma became known as a distinct clinical state. In 1897 Osler described this syndrome so clearly that to date all writers on the subject quote him verbatim.

—MAXWELL GELFAND M D
in *International Record of Medicine and
General Practice Clinics*
p 420 Oct 1953

TABLE 1 Total field activity for 1951

Shard by	Total	Deaths	Nmb f t	Field activity					Ambul	
				Nmb f t						
				1	2	3	4	5		10 m
Total	2199	24	748	425	135	75	19	63	31	29
Share totals										
Civilian	500	12	184	95	31	18	6	24	10	31
Foreign	297	99	1						1	
Ally	244	107	65	27	14	8	2	8	6	38
Civilian	16	10	15	14	1					11
North Atlantic	7	52	3	2				1		23
Caribbean	20	39	12	8	2	1		1		17
Europe	41	149	17	6	6	2		3		24
Sub										
Ally	463	25	197	129	31	14	4	10	9	24
Foreign	508	28	245	139	47	32	6	16	5	21
Military Service	15		9	5	3		1			
Unknown	28									

Total 1951 share total 87 h A val R port f the Surg Gen ml f th United States Navy N M d P-5027 for 1951

TABLE 2 Incidence at continental stations reporting 10 or more cases

St t o	Annual incidence		Monthly incidence											
	Ca	R te	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
National Air Station San Diego Calif	10	0.8	1		1			2		1			4	1
National Training Center San Diego Calif	21	0.7				1	1	2	3		5	4	2	3
Receiving Station San Diego Calif	13	1.2		1	2		1		2	2	1	1	2	1
Marine Corps Training Command Oceanside Calif	20	1.0	1	4	2	2		1	2	2	4		2	
Receiving Station San Francisco Calif	19	1.8		1	1	1	3	1	2	2	3	1	2	2
National Air Station Memphis Tenn	12	1.1	2			1	1	1	3		1		2	1
National Training Center Great Lakes Ill	21	0.8			1	2	3		2	5	3	3	1	1
Naval Training Center Baltimore Md	11	0.6						1		6	2			2
Second Marine Division Camp Lejeune N C	22	0.9	1	1		1	4	4	2	5	2	1		2
Marine Corps Recruit Depot Parris Island S C	20	1.3	1	2	2	2	1	2	2	2	2	2	2	

One patient was steward

Average strength computed from average strengths for July-December. Strength data begin with 3,769 in April and 9,022 in May.

throughout all months of the year. The combined incidence was highest during July, August and September in keeping with the seasonal increase during the period of May through November for all continental stations.

INCIDENCE IN ATLANTIC FLEET

Table 3 indicates that outbreaks of 10 or more cases in the Atlantic Fleet were restricted to large vessels. There are repeated instances of incidence groupings suggesting the possibility of common source epidemics though small in extent. The fact however that 79 percent of the patients were detected during the period each of these ships was in the Mediterranean area or within a month of leaving that area and that the specific annual rates were similar to those of shore stations in the European area emphasizes again the greater likelihood that the disease resulted from the introduction of susceptible individuals into an endemic area. That illness among food handlers was detected on only one of these ships tends to minimize their role in the cause of the outbreaks. Sixteen cruisers and aircraft carriers were on Mediterranean cruises during 1951. The administration of gamma globulin to their crews prior to entering that sea might have prevented 135 of a total of 184 cases but at least 4 000 units would have been needed, at an estimated cost of over \$11 000 and nothing would have been accomplished toward reducing the remaining incidence in the Atlantic Fleet of 279 cases.

In the Pacific Fleet only four ships reported an incidence of 10 or more their average being 10.7 new cases. Sixty five percent of the patients were admitted while the ships were cruising in Far East waters or during the month following. Only one cook was listed as a patient from the four ships.

No incidence rate was computed for ships in the Military Sea Transportation Service because it was not possible to relate the few cases that appeared aboard ship to any specific population. Many voyages are of shorter duration than the incubation period of the disease and admissions occurring during such voyages would not reflect the entire incidence of disease among the passengers.

INCIDENCE AT OVERSEAS STATIONS

Table 4 also reveals the scattered nature of outbreaks in overseas stations where 10 or more patients were admitted. None of the patients was a cook or steward. The effect of season where noted is consistent with that observed for Japan Korea stations as a whole, the period April through November reflecting higher incidence than the remainder of the year.

Although naval stations in the European North African area experienced a high rate as a group apparently none was of suffi-

cient size to support an outbreak of 10 or more cases Ten patients were admitted from two activities in Naples, Italy, during November and December From eight activities in Port Lyautev, French Morocco, 18 patients were admitted during the year with greatest frequency in November and December

From these reports, it is inferred that a gamma globulin prophylaxis policy for all personnel ordered to areas of high endemicity would be impracticable because of the large numbers of personnel involved and the scarcity and expense of the immunizing material

INCIDENCE IN SELECTED CATEGORIES

In table 5, the higher rates for Medical Department personnel are not unexpected, considering their occupational exposure to patients The rates for firemen, cooks, and marines are higher than for all other enlisted men except medical and dental corpsmen The high rate for U S Marine Corps enlisted men may be due to the high incidence for Marine Corps activities in Korea The rates for firemen and cooks have no ready explanation, but in the presence of a high rate among cooks, it is somewhat surprising that no epidemic of food borne type was recognized Cooks and stewards were affected in only 79 of 678 outbreaks at naval activities

TABLE 5 Incidence according to selected categories of personnel

Category	Incident	Rate per 1 000	Category	Incident	Rate per 1 000
Officers	131	1.6	Enlisted	2 068	2.5
Medical Corp	14	3.2	Medical and Dental	116	3.9
Dental Corp	4	2.4	Firemen	144	3.1
Nurses Corp	8	2.5	Cooks	51	3.4
			Marine Corps men	539	3.1

Marine Corps officers presented a rate of 1.4/1 000 average strength
Steward presented a rate of 2.2/1 000 average strength

Rates for Negroes and for all other personnel were identical, 2.4 per 1,000 average strength

INCIDENCE BY LENGTH OF SERVICE AND AGE

Tables 6 and 7 present the incidence according to length of service and age If the 1951 experience is typical it would appear that large numbers of naval personnel may be still susceptible to infection with hepatitis virus after several years of naval

service The scope of this study did not include a determination of whether or not the 1951 illness was the only admission for jaundice during the individual's naval service and therefore

TABLE 6 Incidence of hepatitis per 1,000 active personnel by length of service

Length of service	Rate per 1,000
0 to 2 months	0.6
3 to 5 months	0.9
6 to 11 months	1.8
12 to 23 months	2.4
2 to 7 years	3.5
8 to 19 years	1.8
20 years and more	0.8

throws no light on the question of repeated attacks of hepatitis. Although the incidence rates for older persons and for those with many years of service were relatively low, it is evi-

TABLE 7 Incidence of hepatitis per 1,000 active personnel by age group

Age (years)	Cases	Rate per 1,000
Under 20	213	1.4
20 to 24	1,219	2.9
25 to 29	474	2.8
30 to 34	189	2.0
35 to 39	61	1.4
40 and over	43	1.4

dent that large numbers of young men were still susceptible to hepatitis after two to seven years of service. The lower rates for personnel with more than seven years of service suggest that protection against the disease may have been acquired by virtue of duty assignments or change in habits, or because of an increase in resistance to infection.

SUMMARY AND CONCLUSIONS

The data presented from statistical records of patients admitted for infectious hepatitis in 1951 support the findings of others that the disease usually appears among young persons introduced into an area where the virus is widespread and where certain of the

conditions for natural transmission are fulfilled. No definite evidence of sharply circumscribed epidemics due to a common source was uncovered.

Although incidence rates for older persons with many years of service were relatively low, it is evident that large numbers of young men were still susceptible to hepatitis after two to seven years of service. Incidence rates for Medical Department personnel, due to their exposure to patients, were about twice as high as the average. Marine Corps enlisted personnel had a higher rate than average, related, in a large part, to duty in Korea.

The high rates for firemen and cooks are not readily explained. The importance of the latter group as potential sources of outbreaks was emphasized, but no evidence was found that they had in fact acted as such sources during 1951. Further information is needed to explain the higher incidence rates noted among enlisted cooks and firemen.

After analyzing the data according to geographic location (ashore or afloat), category of personnel, season of the year, and length of service, no basis for selection of personnel for mass prophylaxis with gamma globulin could be suggested that would have materially reduced the total incidence of hepatitis without requiring large amounts of that scarce and expensive material. Should the experience of 1951 prove to be typical, it is suggested that gamma globulin might well be reserved for mass prophylaxis for (1) forces entering a highly endemic area on a mission of great tactical importance, (2) the passive immunization of intimate contacts such as family groups, (3) persons caring for hepatitis patients under conditions where communicable disease techniques cannot be employed, and (4) the control of local epidemics of unusual extent.

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THREE DAY PROGRAM

Best's three-day "biliary flush" is a useful program designed to purge the bile duct of debris by physiologic means. Success is claimed in approximately 25 percent of the cases where common duct stones are present after choledochotomy. Byrne¹ reported a patient in whom Best's flush was therapeutically effective: three common duct stones remaining after cholecystectomy and choledochotomy were cleared into the duodenum and recovered from the stool. The method is contraindicated where complete common duct obstruction exists because increasing back pressure may damage the liver. The program is advocated before any biliary tract operation to wash existing liver stones down into the common duct where they will be accessible at the first operation. Evidence is cited that liver stones are present in about seven percent of all cases of cholelithiasis; this is a likely source of a certain number of remaining or recurrent common duct stones. Best also institutes his regimen two weeks after every cholecystectomy to flush the biliary system.

Best's three day program² on the first and third days, 0.6 mg. of glyceryl trinitrate is given sublingually three times a day and on the second day 0.6 mg. of atropine sulfate is given orally or by hypodermic three times a day. Each morning 8 grams or more of magnesium sulfate in warm water and each evening 1 ounce of olive oil or thick cream are given orally. Three or four tablets of dehydrocholic acid (decholin or procholon) are given by mouth four times a day to increase secretion of bile. Each day gentle irrigation is performed through the T tube with warm normal saline solution and after the T tube has been drained by gravity or aspiration of saline from 10 to 30 cc. of warm sterile olive oil or iodo-brassid (lipoiodine) is instilled into the common duct. If the patient does not complain of distress during this course of treatment the T tube should be clamped off except for a 30 to 60 minute period after each instillation of oil. This three-day routine may be repeated after a few days and can be repeated as many as 10 times in two months. Because it may prove debilitating care should be taken not to exhaust the patient.

ANESTHETIZATION OF SPHINCTER OF ODDI

In regard to the injection of a topical anesthetic into the T tube to relax the sphincter of Oddi, Pribram¹ mentioned the use of 0.5 percent procaine hydrochloride to paralyze the sphincter permitting passage of common duct stones. Harris and Marcus¹ listed dibucaine hydrochloride (nupercaine) as a nontoxic spasmolytic agent and presented one case illustrating its value as follows: postoperative cholangiograms on the thirteenth and nineteenth days revealed absolute block at the sphincter of Oddi. On the

twentieth postoperative day, 10 cc of 1:500 solution of dibucaine hydrochloride was instilled into the T tube. The tube was clamped for 10 minutes, then gently irrigated with 50 cc sterile warm saline solution. A cholangiogram a few hours later indicated no common duct obstruction remaining.

Harris and Marcus also recommended that dibucaine hydrochloride be used by surgeons during operative explorations of the



Figure 1 Cholangiogram 12 days after common duct exploration, demonstrating at least two retained stones

common bile duct to allow easy, nontraumatic dilatation of the sphincter of Oddi. Glenn and Hill¹² and Amsterdam and Sterling¹³ described use of topical anesthetic agents, including 1 and 1.5 percent piperocaine hydrochloride (metycaine), of which 10 or 20 cc injected into T tube relieved obstruction of the common duct by retained stones.

This principle has been verified by Thistlethwaite¹⁴ who cannulated the common duct of dogs, prepared after the method of

CASE REPORT

A slightly built, 24 year old married female, 14 month old child, was admitted on 20 July, 1953, on account of several biliary attacks during the previous year. A roentgenogram of the abdomen showed many calcifications.



Figure 3 Final cholangiogram on thirtieth postoperative day, contrasted with procaine hydrochloride and calcium chloride.

Several days later the patient experienced vertigo, pain, nausea and vomiting, and moderate jaundice. Index was 19, van den Bergh's reaction was + 6.

cent direct and indirect and serum amylase was normal. Cholecystectomy and choledochotomy were performed by one of us (R A McC) on 2 August 1951.

There were at least 50 calculi in the gallbladder the common duct was dilated but contained only gravel. After the common duct was well irrigated with saline solution, a T tube was inserted. The jaundice cleared up several days later. A cholangiogram through the T tube on the twelfth postoperative day, 14 August 1951 (fig 1) showed at least two and possibly three residual common duct calculi with partial obstruction and moderate dilatation of the duct. A repeated cholangiogram on the eighteenth postoperative day, 20 August 1951 (fig 2) demonstrated one stone at the ampulla and probably one proximal to that. On 21 August and 22 August 1951 10 cc of 2 percent procaine hydrochloride was injected into the common duct through the T tube and after 10 minutes of stasis 150 cc of sterile normal saline solution was dripped into the T tube from a flask suspended at a height of two feet above the anterior abdominal wall this level determined by the degree of the patient's discomfort. These irrigations thereafter were abandoned due to slight fever, chills and the leakage of saline solution from the stab wound around the T tube. The van den Bergh reaction and albumin globulin ratio were back to normal on 27 August 1951. A cholangiogram on the thirtieth postoperative day, 1 September 1951 (fig 3) revealed a nondilated common duct free of obstructive calculi. The T tube was kept clamped for three days then removed. Discharged on 1 September 1951 the patient was followed for six months during which period she showed no recurrence of biliary tract symptoms.

SUMMARY

The 15 percent average incidence of choledochal stones persisting after exploration of the common bile duct for calculi presents the surgeon with a problem in management. Three non-surgical techniques are recommended to treat the complications successfully making secondary operations on the common bile duct less necessary: (1) Pribram's ether method, (2) Best's three-day biliary flush and (3) paralysis of sphincter of Oddi by direct application of a topical anesthetic agent. In a case report exemplifying the use of 2 percent procaine hydrochloride to anesthetize the sphincter, sterile saline solution under pressure washed the retained common duct stones into the duodenum. The literature contains many other case reports establishing the worth of these three nonoperative means of eradicating calculi remaining after common duct exploration for choledocholithiasis.

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Taxonomically the tribe *Mimeae* belongs to the family *Parvobacteriaceae* and includes three genera *Mima*, *Herellea* and *Colloides*. The organisms in this tribe are gram negative to gram variable pleomorphic motile or nonmotile rods often showing bipolar staining with little or no biochemical activity on carbohydrates. Serologic classification of the organisms is possible by means of specific antisera.

The organisms isolated in our two patients gave a similar morphologic picture to that described by De Bord and Deacon for the tribe *Mimeae*: i.e. the organisms showed an extremely pleomorphic nature varying from gram negative diplococci on primary isolation to short gram-negative rods and coccobacilli on subculture. The biochemical characteristics are typical of those described for fermentation group 4 as described by De Bord. This group includes the type species *M. polymorpha* in which two organisms isolated in the present cases were finally placed and this identification was confirmed.

Scott and Mahoney¹ state that the number of isolations of *Mimeae* is considerable in those laboratories where attention has been called to the importance of these organisms. In most cases the organisms so isolated were classified as *Herellea* rather than as *Mima* strains, their importance being no less significant however.

DISCUSSION

The two cases reported present several interesting facts. Investigation revealed that both airmen were residents of same barracks and slept in the same room. They both became ill at about the same time. This opens vistas as to the epidemiologic factors long observed in epidemic cerebral mon-

Bacteriology technicians must be aware that *M. polymorpha* may be the causative agent in diseases of this type. Under ordinary circumstances the organism might be classified as a member of the *Neisseria* group. This was well exemplified because cultures from patient 1 were sent to 13 other laboratories as a survey specimen. None recognized the organism. One laboratory approached proper identification by placing it in the *Haemophilus* group. Six laboratories classified it as a species of the genus *Neisseria*, three reported it as *N. meningitidis*, one called it a species of the genus *Neisseria*, another reported a gram negative diplococcus, and one reported it as an unidentified organism. This illustrates how this organism may be erroneously classified. Its failure to ferment carbohydrates often leads to a hasty classification as a species of the *Neisseria* or *Alcaligenes* genera.

The fatal case exhibited a fulminating course with little clinical response to penicillin in the dose administered. The second case responded to penicillin and sulfadiazine. In both, sensitivity tests to the causative organism showed that in vitro penicillin was efficacious. The case of subacute bacterial endocarditis reported by Pike and co-workers responded to oxytetracycline.

The lesson to be learned from these two cases is that *M. polymorpha* can on occasion cause a fatal septicemia and it can be easily confused with members of the *Neisseria* group. The relative importance of the *Mimaceae* as pathogens must await further observations.

SUMMARY

Of two patients with severe systemic infection due to *M. polymorpha* one died and, at autopsy, revealed classical findings of adrenal hemorrhage and generalized petechiae.

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There is nothing constant in the human body. It is a process of flow into the cells. They all bear potential for change. It is a shifting ever-renewing of the components of the body. It must be renewed or there will be deterioration. It is the patient's destiny.

—THAT IS THE MESSAGE
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THE POSSIBLE ROLE OF HISTAMINE IN EPIDEMIC HEMORRHAGIC FEVER

An Evaluation of Antihistamine Therapy

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SINCE 1950 the disease entity epidemic hemorrhagic fever has occurred in spring and fall outbreaks among United Nations troops stationed in Korea. The Japanese described a probably identical disease which occurred in 1936-1939 among their soldiers then occupying Manchuria. Careful clinical and pathologic studies in Japan suggested that the painless bite of a mite parasitic to the field rodent transmitted the causative agent. Recent workers have not been able to verify this. Intensive study by various investigators since 1950 has disclosed much of the natural course¹⁻⁴ pathology⁵ and epidemiology⁶ of the disease although the causative agent and its mode of transmission remain unknown. Experience with hundreds of patients with this disease however has led to adoption of supportive therapy which has reduced mortality.

Widespread vascular damage is believed by nearly all observers to be the basis for many of the clinical and pathologic features. Facial flushing, scleral and conjunctival injection and hypotension have been related to capillary dilatation. Facial edema, albuminuria and retroperitoneal edema have been ascribed to altered capillary permeability and capillary rupture has been considered responsible for the cutaneous and visceral hemorrhages. The histologic findings which include capillary dilatation, engorgement, transudation of fluid and finally endothelial destruction with rupture and hemorrhage correspond closely to these clinical features.

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POSSIBLE ACTIVITY OF HISTAMINE

The very widespread nature of these changes suggested that a humoral agent may be the active toxin in the pathogenesis of epidemic hemorrhagic fever. Histamine is one of the many substances capable of damaging blood vessels, particularly capillaries. Many of the changes observed in experimental histamine intoxication of human beings and animals correspond to changes seen in the disease. Congestion and hemorrhage are found in the kidneys, gastrointestinal tract, and pituitary gland with regularity at autopsy. Histamine is normally found in high concentrations in the mucosa and submucosa of the stomach and small intestine¹⁰ and in the kidneys.¹¹ Congestion and hemorrhage at these sites may be the result of histamine release. Although data on histamine content of the pituitary gland are scant, impure pituitary extracts contained histamine¹² and it may be speculated that release of histamine causes the marked hemorrhage and necrosis seen in the pituitary gland at autopsy.

Certain hematologic changes characteristic of hemorrhagic fever may also point to histamine activity. Thrombocytopenia and the presence of macrothrombocytes have been noted early in the illness and eosinophilia varying from 5 to 18 percent occurs during early convalescence.^{1,4} Intravenous administration of histamine caused a 30 percent reduction in platelets in dogs, and a clumping and early disintegration of platelets in both human beings and dogs.¹³ There is also some evidence that carriage of histamine is a function of the eosinophilic myelocyte,¹⁴ and it is possible that the eosinophilia occurring during convalescence from hemorrhagic fever may represent reaccumulation of histamine after its discharge early in the disease.

If increased histamine activity occurs in hemorrhagic fever, the causative agent may produce histamine or a similar substance, but it seems more likely that an antigen antibody reaction is concerned. Although no immunologic data are available on hemorrhagic fever, certain hematologic observations suggest the presence of an immune reaction. The blood and bone marrow smears from patients with hemorrhagic fever contain increased numbers of plasma cells (fig 1), as well as atypical lymphocytes. Such cells are seen in virus infections, serum sickness, penicillin reactions, and other states in which antibodies are being formed. Pariser and associates¹⁵ have demonstrated that plasma cell counts of blood and marrow in human beings undergoing an anamnestic response to diphtheria toxoid rise. It may be theorized that the hematocellular response in hemorrhagic fever parallels the production of antibody formed in response to the antigenic stimulus of the causative agent. Further, throm

No patient in the entire series had shock. The blood pressure curves for the two groups were similar and the incidence and degree of hypertension during recovery was the same for each group.

Nonprotein nitrogen and blood urea nitrogen were measured daily. No significant difference was observed in the duration or amount of nitrogen retention or proteinuria between the two groups.

Measurements of urinary output revealed that oliguria was less frequent in patients who received diphenhydramine hydrochloride. Only five of 11 patients in this group developed oliguria (output of less than 1 000 cc in 24 hours) whereas nine of the 13 patients in the control group developed oliguria.

DISCUSSION

The data presented are difficult to evaluate. The most impressive differences between the two groups consist of fewer instances of oliguria and scleral hemorrhage in the group of patients treated with diphenhydramine hydrochloride. Conceivably this was a chance result of more severe cases among the control group. The more rapid disappearance of symptoms and physical signs in the patients treated with diphenhydramine hydrochloride may merely reflect nonspecific effects of the drug rather than specific antihistaminic effects on the course of the disease. Because no specific treatment for hemorrhagic fever has been established antihistamines may have some value in symptomatic therapy and further evaluation seems to be indicated, as well as attempts to delineate the possible role of histamine as a pathogenic agent.

SUMMARY

In the pathogenesis of epidemic hemorrhagic fever histamine may play a major part. Antihistamine therapy of hemorrhagic fever was evaluated in a small controlled series using a blind technique. The results were equivocal but suggest the need for further evaluation of this approach.

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Serologic Tests for Cancer

Unless some serodiagnostic test which will be suitable for general screening purposes is developed it is difficult to see how there can be much improvement in the early diagnosis of cancer particularly internal cancer. By present diagnostic means it is difficult to diagnose cancer in its earliest localized and particularly the subclinical stage before any symptoms are present. There is no known chemical property which is characteristic for cancer alone. There is much to learn about the blood proteins and methods will have to be found to further fractionate these proteins. Negative results are just as important as positive results in many instances and it may be that specific tests will be found which will be applicable for special types of cancer and not necessarily for all cancers. At present there is no serodiagnostic test that is completely specific for cancer but an open minded conservative attitude must be maintained by physicians on this subject for there is prospect that much useful practical information will come from present studies and that with added knowledge a general screening test for cancer can be developed.

—JUSTIN J STEIN M D

in *California Medicine* p 4 Jan 1954

MYOCARDIAL INFARCTION IN YOUNG MEN

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CORONARY artery disease occurs most commonly in the sixth seventh and eighth decades of life but atherosclerosis of the coronary arteries can occur in all age groups

Smith and Bartels¹ in 1932 reported two cases of myocardial infarction in patients aged 35 and 36 years and stated that a review of the literature up to that time revealed only 20 confirmed cases of myocardial infarction in patients under 40 years of age In 1937 Durant reported seven patients 35 years of age and under observed during a four year period In the same year Glendy and associates² reported 100 patients under the age of 40 collected from several hospitals and clinics in a three-year period but only eight were under 30 French and Dock in 1944 analyzed the clinical and pathologic features of fatal coronary artery disease in 80 soldiers aged 20 to 36 from data received by the Armed Forces Institute of Pathology since the beginning of World War II Most of the patients in this series had been overweight and in every one arteriosclerosis had been the basic lesion

From these reports it appears that coronary artery disease occurring before middle life cannot be considered a rare entity Because young male adults make up the largest segment of the practice of military medicine I wish to analyze my experiences with myocardial infarction in patients 35 years of age and under

DESCRIPTION OF THE GROUP

During the past four years 14 patients in the specified age group with confirmed diagnosis of myocardial infarction have been treated at this hospital The diagnosis was established in 12 cases on the basis of typical clinical features plus unequivocal electrocardiographic changes In two patients death occurred before electrocardiographic studies could be made but postmortem studies corroborated the clinical impression

The youngest patient in the series was 23 years old and four patients were 27 years of age or under The largest number of cases occurred in the 34 and 35 year old groups which included eight of the 14 patients

Body build of the patients was roughly divided into slender, medium, heavy, and obese. About 50 percent of the group could be classified as heavy or obese. Admittedly, this series is small, however, percentagewise, overweight occurred less frequently in this group than in the series reported by French and Dock, who found it in 91 percent of their patients. They stated that overweight is a strong presumable causative factor in coronary artery disease of young men. It is interesting to note that none of the patients in the present series was classified as slender.

The height of the patients was recorded in 12 of the clinical records. If 5 feet 10 inches is accepted as average adult male height, 75 percent of the patients were below average height. The shortest was 5 feet 2 inches tall, and the height of 45 percent of the group was 5 feet 7 inches or less. None of the patients were as tall as 6 feet.

In reviewing the past medical histories of these patients, there was a paucity of possible causative agents. In 10 patients the past history was completely negative from a cardiovascular point of view. One patient had had tachycardia four years previously, with negative electrocardiographic findings. Two patients were known to have had hypertension. One of these had had a previous sympathectomy and currently was taking hexamethonium chloride and 1 hydrazinophthalazine hydrochloride (apresoline). One family history revealed that a brother of the patient had a myocardial infarction at the age of 40.

There were no premonitory symptoms in slightly over half of the group, the symptoms of infarction being acute and unheralded. Five patients had mild exertional angina or vague chest pains ranging from three days to three weeks before the attack. One patient had intractable nausea and vomiting for 24 hours prior to the onset of acute substernal pain.

In 12 cases, the time of day when the attack occurred was recorded. The patients noted the first symptoms during what could be classified as working hours—that is, between 0800 and 1800. Four cases occurred from 1800 to midnight and five from midnight to 0800. The degree of physical activity at the time of first symptoms was recorded in 12 instances. Five patients were presumably awakened from sleep with acute substernal pain, five were engaged in routine physical activity, and two were performing strenuous physical activity.

In 75 percent of the group the initial symptoms could be classified as "textbook" myocardial infarction in that the patients complained of a sudden, severe, crushing substernal pain radiating down one or both arms and associated with weakness and sweating. Two patients complained of dull, pressure like pain.

in the epigastrium radiating to the neck or arms. In one of these pain gradually rose and centered in the substernal area.

The pain was described by two patients as a burning sensation in the left anterior chest. In the remaining case the complaint was of a substernal drawing sensation.

The symptoms in one patient are presented as being atypical for this series. A 31 year old man was perfectly well until 24 hours before admission. His evening meal had included sauer kraut and frankfurters and before retiring he had eaten a liver wurst sandwich and iced canned fruit juice. He was awakened with a dull pressure like pain in the epigastrium which did not radiate associated with nausea and vomiting which persisted throughout the day. He was not improved by symptomatic therapy at sick bay and consequently was admitted to this hospital with the diagnosis of acute gastritis. The past history and family history were not contributory. Physical examination revealed an *acutely ill man with marked epigastric tenderness not associated with muscle spasm*. There were no other pertinent physical findings. Thirty six hours after the onset of symptoms the epigastric pain shifted to the substernal area and the patient was re examined. At this time a precordial systolic friction rub was detected and an electrocardiogram revealed evidence of an acute anterior myocardial infarction. That coronary occlusion can simulate a pathologic condition below the diaphragm is well recognized but in this case it was unsuspected because of the relative youth of the patient.

With the exception of apprehension and pain the physical examination on admission was negative in 50 percent of the patients. The pertinent physical findings in the remaining seven patients were as follows. Two were hypertensive, two presented arrhythmias, two were in shock and a precordial friction was detected in one. In only one case was cardiomegaly present. This observation is in agreement with French and Dock who found no significant cardiac hypertrophy in their series of 80 cases.

With the exception of the white blood count, sedimentation rate and electrocardiographic records, laboratory findings were within normal limits. Electrocardiographic records were available in 12 of the cases, however two patients died before this procedure could be employed. Seven patients revealed evidence of anterior wall infarction and the remaining five showed posterior wall involvement. In one case serial electrocardiograms were equivocal for the first three days, after which time evidence of posterior wall infarction appeared.

Death occurred in three of the 14 patients, two patients died within three hours of their initial symptoms and the third died

24 hours after admission Postmortem studies were permitted in two of the three fatal cases

CASE REPORTS

Case 1 A 34 year old obese man had been well until two hours before admission, when he developed a sudden, severe, constricting precordial pain associated with marked dyspnea. On admission he was in shock and in marked respiratory distress. Although the usual supportive measures were employed, he died 25 minutes later. Postmortem studies revealed moderately advanced arteriosclerotic changes in all the coronary vessels. The anterior descending branch of the left coronary artery was found to be obstructed by a firm thrombus. There was an area of infarction in the anterior wall of the left ventricle near the apex.

Case 2 A 35 year-old obese man, who had had no previous cardiovascular complaints, was awakened from sleep with severe, crushing, substernal pain that radiated down both arms. He died in the emergency room 10 minutes after arrival. Postmortem studies revealed marked atherosclerosis of all coronary arteries with complete occlusion of the circumflex branch of the left coronary artery by a red thrombus.

Of the 11 patients that survived the hospital course was uneventful in seven. Two patients developed frequent premature ventricular contractions which were controlled by quinidine. One patient complained for one week of crampy substernal pain relieved by glyceryl trinitrate, and one patient had persistent left shoulder pain for several weeks.

COMMENTS

The findings in these 14 patients parallel closely those reported by numerous authors. It is disconcerting that advanced coronary artery disease can be present in younger patients without premonitory symptoms, apparent loss of cardiac functional capacity, or cardiomegaly. Shortness of stature and overweight occurs too frequently to be coincidental. Therapeutically, we cannot change height determining genetic factors; however, slenderizing does fall within the province of the medical profession. Too often the stocky young man has become tolerant of his obesity and accepts it as a familial characteristic. Weight reduction in such an individual is no guarantee against premature coronary arteriosclerosis, but unquestionably cardiac work at rest will be decreased as normal weight is approached, an accomplishment worthy of the combined efforts of patient and physician. Vague anginal like symptoms must be viewed with suspicion in the younger age groups and are deserving of careful electrocardiographic investigation.

SUMMARY

In an analysis of myocardial infarction in 14 hospital patients 35 years of age and younger during the past four years, overweight was a common finding and in no instance was underweight encountered. Seventy five percent of the patients were below average, adult male height. Premonitory symptoms occurred in five patients but in most instances were atypical for angina pectoris. Mortality rate for this series was 21 percent.

Avoidance of obesity and electrocardiographic investigation of chest pain in the younger age groups are urged.

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Economy in Air Evacuation of Patients

Tr n portat on thro gh the ages h s changed the strategy of war and the activities of peace. The unique capability of helicopter combined with larger air carriers provides the means to furnish civilian and military medical care at great economies in personnel and facilities. Air transportation reduces the need in evacuation of wounded for many treatment units formerly required because of the limited facilities of surface carriers. Air transportation can also provide care in transit. The full acceptance of the helicopter airliner combination would permit elimination of many medical facilities and supplementary means of transportation now used in combat zones. Additional savings to the national medical economy could be obtained by the use of aerial hospitals. The cost would be practically no relocation of civilian medical effort in war.

—M S WHITE, Brigadier General, USAF (MC) d

ROBERT W. MERRILL, Major, USAF (MC)

J Am J th Am a M d J A oc t p 22 Sept 5 1953

STANDARDIZING A METHOD FOR CLINICAL HEMOGLOBINOMETRY

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A RECENT survey of the comparative accuracy of the various methods of hemoglobinometry used in the clinical laboratories of the armed services disclosed a disturbing lack of uniform results. For this reason, the provision of some means whereby these laboratories can standardize the measurement of hemoglobin is desirable. The department of hematology of this school accordingly has been authorized to establish a hemoglobin reference facility for the clinical laboratories of the armed services, for the purpose of providing accurately measured, stable solutions of hemoglobin that can be used as standards. The standards may be obtained by clinical laboratories of the armed services from this school.

The solutions are prepared as cyanmethemoglobin, the most stable of the various hemoglobin pigments. Drabkin¹⁻³ has kept similar solutions in his laboratory for six years without deterioration. Solutions we have prepared have been tested by Drabkin⁴ and were found to agree with his own standards through the second decimal place. The standards of Dr E J King and those of Drabkin are in similar agreement,⁴ therefore it may be concluded that the hemoglobin solutions provided are both accurate and stable. They should be sealed in carefully matched tubes, and together with the blank solution that accompanies them should be refrigerated in darkness but should not be frozen.

The value of these standards was established using a Beckman DU spectrophotometer by reference to the optical density of solutions of copper sulfate as described by Drabkin.⁴ The use of copper sulfate as the standard for calibration of the Coleman Jr spectrophotometer for clinical laboratories is not practical because it involves the use of a multiplication factor which magnifies small errors inherent in the instrument.

The standards, representing blood diluted one part in 250 parts of the solution, are provided in three tubes with concentrations of

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Washington D C

hemoglobin corresponding to 5, 10 and 15 grams per 100 ml (fig 1) The readings of the standards in a properly calibrated photometer are plotted on semilogarithmic graph paper and the points connected by a line This graph may be used to establish the concentration of hemoglobin in unknowns

STANDARDIZATION OF EQUIPMENT FOR HEMOGLOBINOMETRY

It would be futile to establish accuracy in one aspect of the method without achieving corresponding accuracy elsewhere The

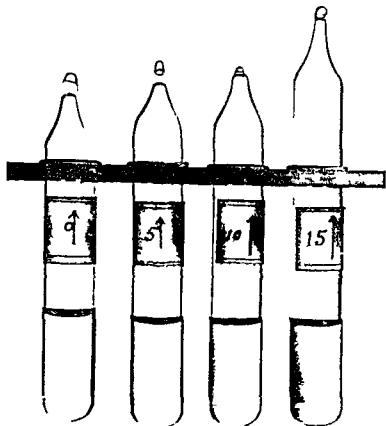


Fig 1 The cyanmethemoglobin standards film used with the photometer. The tubes marked 15 contain 0.02 ml of blood and 5 ml of Dabkin's solution. The concentration of hemoglobin in the blood is adjusted to 15 grams per 100 ml. The error in the use of the tube that is used for the light source of the photometer

standardization of equipment used for hemoglobinometry by a conscientious technician familiar with the use of an analytic balance requires half a day

Calibration of the Coleman Jr spectrophotometer * A survey of a number of these instruments in clinical laboratories of the armed services has indicated that some have serious errors of wave-length calibration. This instrument is provided with a factory calibrated didymium standard filter to verify the calibration. The steps in calibration are

1 The battery is checked with a volt meter (6 volts), or the specific gravity of the battery fluid is measured (1.120 for low specific gravity batteries, 1.250 for high specific gravity batteries)

2 The instrument is turned on and allowed to warm up for 20 minutes. The coarse and fine knobs are turned as far counter clockwise as possible.

3 The photocell is darkened by placing a cuvette adapter in the well with its key 90° clockwise to the well keyway, thereby obstructing completely the beam of light.

4 The galvanometer zero adjustment lever is located under the raised housing to the left of the well. By use of a pencil point to move the lever, the center of the galvanometer light beam is brought to coincide with the zero index on the left side of the scale panel.

5 The wave length scale is set at exactly 610.

6 The well opening is covered and, by using the coarse and fine knobs, the center of the galvanometer light beam is brought to coincide with 100 percent light transmittance on the right of the black scale.

7 The glass surfaces of the didymium calibrating filter are carefully cleaned and the filter inserted into the well, with the key still seated in the slot. The galvanometer reading (light transmittance) should correspond with the number engraved on the side of the standard.

8 If the measured value of light transmittance and the engraved number do not agree, an adjustment should be made after removing the metal panel on the bottom of the instrument by unscrewing the four rubber feet. Squarely in the center of the instrument a large brass thumb screw will be seen. If the value of light transmittance was less than that engraved on the standard, the thumb screw should be turned clockwise (from its top) two clicks for each one percent difference in light transmittance. If the measured value of light transmittance was more, the screw should be turned counterclockwise.

hemoglobin corresponding to 5, 10, and 15 grams per 100 ml (fig. 1). The readings of the standards in a properly calibrated photometer are plotted on semilogarithmic graph paper and the points connected by a line. This graph may be used to establish the concentration of hemoglobin in unknowns.

STANDARDIZATION OF EQUIPMENT FOR HEMOGLOBINOMETRY

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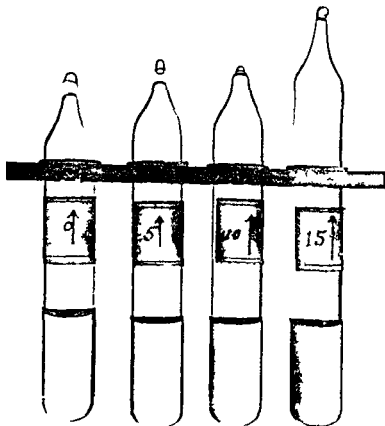


Fig. 1. The cyanmethemoglobin standard solutions from the standard method photometer tube. The tubes marked 15 contain 0.02 ml of blood, 5 ml of D. B. K. 150. The concentration of hemoglobin in the blood is adjusted to 15 grams per 100 ml. The arrangement of the tubes is that of the light source in the photometer.

standardization of equipment used for hemoglobinometry by a conscientious technician familiar with the use of an analytic balance requires half a day.

1 Several 0.02 ml pipettes are cleaned with concentrated nitric acid, washed, and dried

2 Pipettes, mercury, weighing bottles, balance, and thermometer are kept in the same room and the procedure is not begun until all have reached the same temperature. Mercury is placed in the beaker. The weighing bottles are carefully weighed, and the weights recorded.

3 The plunger of the tuberculin syringe is heavily coated with petrolatum or stopcock grease and the syringe is assembled. The tip of the syringe is inserted firmly into the hole in the rubber stopper and the stopper with the syringe on top is clamped to a heavy apparatus support about 18 inches above the level of the bench in a vertical position.

4 The base of a pipette is firmly inserted into the other end of the stopper.

5 The plunger of the syringe is slightly withdrawn. The tip of the pipette is immersed in the mercury. Careful upward movement of the syringe's plunger by twisting fills the pipette with mercury. When mercury reaches the 0.02 ml mark the beaker is rapidly removed. Usually there will be no movement of the level of the mercury and no mercury will be lost from the tip. If either occurs, the maneuver is repeated. The pipette must not be moved or jarred. When a successful measurement has been made, the mercury is discharged from the pipette into a weighing bottle. Determinations should be made in duplicate. The bottles which have been previously weighed are weighed again with the mercury, and the weight of the mercury is thereby established.

6 The volume occupied by this weight of mercury at the prevailing temperature is established by dividing the weight by a temperature correction factor.

Temperature	Correction factor
20 C	13.547
21 C	13.545
22 C	13.543
23 C	13.541
24 C	13.539
25 C	13.537
26 C	13.534
27 C	13.532
28 C	13.530
29 C	13.528
30 C	13.526

7 The actual volume of the pipette thus determined is expressed in milliliters. This figure, divided by 0.02 (the number

of ml supposed to be measured by the pipette) gives a correction factor for the pipette. This should be scratched on the side of the pipette with a diamond point pencil.

Example If the weight of the weighing bottle equals 39.8731 grams and the weight of the bottle plus mercury equals 40.1311 grams, the difference in weight is 0.2580 gram. This value divided by a temperature correction factor for 20° C (1.0528) equals 0.0191 ml of mercury delivered from the 0.02 ml pipette. 0.0191 is divided by 0.0200 ml and the result 0.96, represents the correction factor for the pipette. To use this factor the transmittance reading of a cyanmethemoglobin solution prepared with this pipette is multiplied by 0.96 and the corrected transmittance reading for a volume 0.0191 ml is obtained.

METHOD FOR CLINICAL HEMOGLOBINOMETRY

Preparation of Drabkin's solution The amount to be prepared should be governed by the amount of hemoglobinometry required of the laboratory. Five milliliters of solution are used for each test. To prepare 1 liter of solution 1 gram of NaHCO_3 , 0.2 mg of KCN and 198 mg of $\text{K}_3\text{Fe}(\text{CN})_6$ are used. These are dissolved in distilled water to make 1 liter of solution which should be stored in a brown bottle because light causes a precipitate to form. Although Drabkin's solution contains little cyanide it is regarded as a poison.

Precautions regarding the use of cyanide Salts and solutions of cyanide are poisonous and care should be taken to avoid getting them into the mouth or inhaling their fumes. Cyanide should be handled with the same caution as concentrated acids and pathogenic bacteria. The minimum lethal dose of anhydrous cyanic acid for humans is 36 mg. In a liter of Drabkin's solution there are 115 mg of cyanide as CN. The smallest dose of potassium cyanide that has been known to kill a human is 300 mg. This amount of potassium cyanide is equivalent to that present in 2.6 liters of Drabkin's solution.

The cyanmethemoglobin method as described in this article has been reviewed by the staff of the Army Environmental Health Laboratory which reported: "It is the opinion of this office that the analytic procedures described can be performed without undue hazard to laboratory personnel providing proper caution is used." The following specific precautionary measures are recommended:

1. Pipettes should be filled with a suction bulb.
2. Blood should be mixed with the cyanide solution by swirling.
3. If small amounts of cyanide compounds are accidentally spilled on the laboratory bench or on the floor during the weighing

procedure, the dry powder should be wiped up with a damp cloth and discarded in a suitable container

4 Cyanide salts should be stored in a locked cupboard

Calibrating the Coleman Jr spectrophotometer for the cyan methemoglobin method

1 To span the light beam of the Coleman Jr spectrophotometer there must be at least 6 ml of solution in the 19 mm cuvette. The accurate measurement of 6 ml is cumbersome because transfer pipettes are not available in that size and serologic pipettes are inadequate. Therefore it is recommended that the instrument be slightly modified to permit accurate readings with a smaller volume of solution. A 5 mm slice should be cut from the top of a No. 1 rubber stopper and dropped into the cuvette adapter so that it lies flat on the bottom. This elevates the cuvette sufficiently that 5 ml of solution span the light beam.

2 The tubes containing the hemoglobin standards after removal from the refrigerator, should be wiped free of condensed moisture before they are used. When they are placed in the well of the spectrophotometer, the arrow on the side of the tube should face squarely toward the source of light.

3 The blank tube is placed in the well of the warmed up Coleman Jr and the galvanometer beam is adjusted to 100 per cent light transmittance (at the right of the black scale) with the wave length scale at 540.

4 Tube 5 is next placed in the well. The reading on the black scale (percentage of light transmittance) is recorded. The blank is checked and the percentage of light transmittance is recorded for tube 10. Tube 15 is measured in the same manner.

5 The readings are transcribed onto semilogarithmic graph paper. The abscissa represents grams of hemoglobin and the ordinate the percentage of light transmittance. Tube 5 represents 5 grams of hemoglobin per 100 ml. On the vertical line representing 5 grams of hemoglobin on the graph paper, a dot is placed at the level of the percentage of light transmittance indicated by the reading on the Coleman Jr for tube 5. In the same manner the percentage of light transmittance for tube 10 (10 grams of hemoglobin per 100 ml) and tube 15 (15 grams of hemoglobin per 100 ml) is plotted (fig. 2).

6 A line is drawn through the three points and a table is prepared from this graph to show what each reading of the percentage of light transmittance corresponds to in grams of hemoglobin per 100 ml. The table can be mounted between sheets of plastic or clean x-ray film. Each spectrophotometer must be

standardized individually against the cyanmethemoglobin solutions and should be frequently checked thereafter

7 The standards should be returned to the refrigerator. They should be used once a week to check the calibration of the instrument

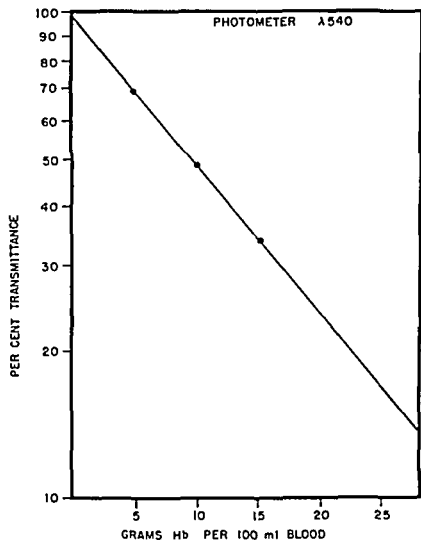


Fig. 2 The light transmittance of the cyanmethemoglobin standard solution plotted on a logarithmic graph. From this very small of transmittance, the best limit is a more practical hemoglobin concentration.

Method for hemoglobin determination with cyanmethemoglobin

1 Exactly 0.5 ml of Drabkin's solution are measured into two matched Coleman Jr tubes. To one tube 0.02 ml of whole

blood is delivered with a Sahli pipette which is rinsed repeatedly so that all of the blood is delivered. Blood and solution are mixed by swirling and allowed to stand for 10 minutes. The other tube serves as a blank.

2 The cuvette adapter is altered as described

3 The blank tube is placed in the well of the warmed up Coleman Jr spectrophotometer and the wave length scale is set at 540. Using coarse and fine adjustment knobs the galvanometer light beam is adjusted to coincide with 100 percent light transmittance at the right of the black scale. The tube containing the hemoglobin solution is substituted for the blank tube and the percentage of light transmittance is read on the black scale. The value obtained is multiplied by the correction factor of the pipette. The result is translated into grams per 100 ml of hemoglobin by use of the graph constructed.

4 Where a large series of hemoglobin determinations are to be made simultaneously, the same 0.02 ml pipette can be used for each. Two small beakers, one containing water, the other acetone, should be available. The pipette is attached to a length of latex tubing about 20 inches long with an ordinary plastic mouthpiece at one end. After the first specimen of blood has been measured the pipette is rinsed three times with water. The water is expelled in a waste receptacle and the outside of the pipette is wiped with gauze. The pipette is then washed three times with acetone, the outside wiped, and air sucked through the pipette until the inside is dry. The whole procedure requires about 10 seconds. It reduces the number of calibrated pipettes needed for a large laboratory service and it simplifies the use of the correction factor of the pipette. Pipettes should be cleaned with concentrated nitric acid at least once a week.

As a trial of this method, sets of standards (fig 1) were sent to several Army hospitals followed later by a questionnaire to learn if the method was in use. A tube of blood was also sent to test the accuracy of their hemoglobinometry. The concentration of hemoglobin in the sample (13.25 grams per 100 ml) had been carefully established by comparison with standards checked by Drabkin. Ten laboratories responded. The results shown in table 1 indicate that satisfactory hemoglobinometry had been achieved using the method recommended.

SUMMARY

Using the Coleman Jr spectrophotometer and Drabkin's solution a method of standardizing hemoglobinometry for clinical use is described. The procedure for standardization of the equipment involved is given in a detailed description of the methods

TABLE 1. 11 m gl b m try t l rmy b p t l l b t w th m pl f bl od th t t d 13 25 gr ms p 100 ml

Labo y	M thod f l br t	M thod f h m gl b om try	R lt	
			Gram p t 100 ml	P t f l
G p 1	1	AMSGS	13 2	100
	2	AMSGS	13 3	100
	3	AMSGS	13 3	100
	4	AMSGS	13 4	101 1
	5	AMSGS	12 9	97 9
	6	AMSGS	13 0	98 1
G p 2	6	A d h mat	12 7	95 8
	7	Ac d h mat n	12 5	94 3
	8	Oxyh m gl b	12 0	90 6
G p 3	I naly	Cy m h m gl b	11 7	87 3
G p 4	U k wn	Oxyh m gl b	11 9	89 8

AMSGS A my M d l S Gradus S hool
 l b ra cry 6 port d 2 m hod
 G p 1 L bora us l g AMSGS ta d d l bra h ya m h m gl b me h d
 G p 2 L bora us AMSGS nd d l bra m b me hod
 G p 3 L bora us h ta da d t cal bra h ya m h m gl b m thod
 G p 4 L bora us h ta d d l bra m h me hod

of calibrating the instrument, selecting matched colorimeter cuvettes, and calibrating the blood diluting pipettes. The method for clinical hemoglobinometry is outlined by a description of the preparation of Drabkin's solution, and of the method for hemoglobin determination with cyanmethemoglobin.

Laboratories of the U S armed services may obtain the standards described from this laboratory.

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- 5 Steen G F Smith G W and Cooper J A D A graphical method for the calibration of hemoglobin meter *Am J Clin Path* 21 489-491 May 1951
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ADDENDUM Since submission of this manuscript further experience indicates that following the completion of step one given under the method for hemoglobin determination with cyanmethemoglobin on page 701 if the fluid is turbid because some of the red cells have not been hemolyzed a few milligrams of powdered saponin should be added.

Medicine's Number One Problem

The practice of rehabilitation for the general practitioner or for any doctor begins with the belief in the basic philosophy that the doctor's responsibility does not end when the acute illness has ended or surgery has been completed. It ends only when the patient has been retrained to live and to work with what is left. This basic concept of the doctor's responsibility can be achieved only if rehabilitation is considered an integral part of medical service. Any program of rehabilitation is only as sound as the basic medical service of which it is a part. The diagnosis and prognosis must be accurate for it is upon them that the feasibility of retraining is determined.

—HOWARD A RUSK M D

New England Journal of Medicine p 233 Aug 6 1953

THE TREATMENT MILIEU

Its Importance in the Prognosis of the Schizophrenias

STANLEY E. WILLIS, L. ten 1 (MC) USN

IN 1946 Mary Jane Ward wrote a semifictionized account of an experience in a psychiatric sanitarium under the title of *The Snake Pit*. She selected her title from the following description of an ancient method for the treatment of persons with mental disorders: Long ago they lowered the insane persons into snake pits; they thought that an experience which might drive a sane person out of his wits might send an insane person back into sanity. The author's account of the treatment received in the hospital left readers with a feeling of horror. Many of the incidents which shocked their sensibilities were understood to have resulted from institutional rigidity, empirical treatment methods, cruelty, inadequate personnel, and other related factors. On the whole, the book seemed to indicate a failure of the treatment techniques which are standard in the institutional care of psychotics. If blame must be fixed, however, I believe the failure lay with the environment and the environmental attitude, or if you will, the milieu in which the treatment was undertaken, and not with the techniques *per se*. It is my purpose to present several concepts concerning the relationship between the treatment milieu and the prognosis of mental disorders.

I would like to ask you to re-examine whatever formulations you may have reached about institutional psychiatric treatment and the prognosis of schizophrenia in the light of several concepts concerning treatment which have been useful here on the somatic therapy service of this hospital. These concepts evolved as an attempt to explain why somatic therapy techniques, such as deep insulin coma or electroconvulsive therapy, should prove efficacious in one particular setting yet not in another. It is my belief that the reason for discrepancies in the reported rates of cures, and for the wide disagreements between various authorities concerning the ultimate prognosis of the schizophrenias by various treatment techniques, becomes apparent when one examines the most tangible and basic variable of the treatment—the milieu in which the treatment is undertaken. Milieu includes not only

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the physical dimensions and facilities in which treatment is undertaken, but the attitude of the medical and nursing staff as well

One of the areas most obviously in need of critical re-evaluation is the attitude of part of the medical profession itself toward the prognosis of that group of mental disorders which have been dumped into the nosological wastebasket and labeled "schizophrenia." It is a popular belief, even among physicians, that schizophrenia is an incurable disease which dooms its victims to ultimate deterioration and dementia. My contrary opinion reflects the belief that the prognosis of any mental disease is only what the medical profession permits it to become and that an attitude of pessimism in a therapist is nihilistic and may lead him to neglect the patient. In the case of schizophrenia, that pessimism may imply a rejection of the patient that may materially aggravate the emotional threat which precipitated the psychotic reaction. Some of the misconceptions held by the general public as well as by many physicians about the allegedly unfavorable prognosis generally assumed for schizophrenia are caused by a failure of many practitioners to take into account and apply modern treatment methods which have evolved during the past 15 years, or to make use of the knowledge of the dynamics of psychopathology provided by modern psychobiologic or psychoanalytic research.

THE EMOTIONAL "ALARM REACTION"

I sometimes wonder if psychiatrists even more than other physicians, do not fail to consider the fact that there is an inherent, biologically determined urge toward health which is as much a function of the mental and emotional aspects of the human organism as is the drive toward health and recuperation of the physical aspects of that organism. I sometimes wonder if our belief that a disease has a poor prognosis may not serve only to appease our need to assign treatment failures to the disease itself rather than to admit our lack of knowledge of the disease process or our failure to effect an understanding application of our knowledge in a manner which produces therapeutic movement. I believe that one might draw an analogy between schizophrenia and the variation in its clinical course and the collagenous diseases and the body's response to alarm in the reticuloendothelial system, as recently publicized by Hans Selye.²

A comparison of the physical alarm reaction of body tissues to the onslaught of disease with the mental or emotional defense reaction of the individual to disintegrating emotional threats suggests that as the body makes an attempt to maintain itself against sudden imbalance by homeostatic physiologic mechanisms,

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These defensive reactions may be manifested on any one of various levels of response, ranging from socially acceptable adjustments made in everyday living to pathologic mechanisms used only under extreme psychologic stress. The use of pathologic emotional defenses can be likened to the retreat under stress of a field army through the various echelons of its advance. While the use of garrison troops in lieu of field troops may not be as effective, it is better than no defense at all and may prevent annihilation until the field troops can reorganize. This can be likened biologically to the body's attempt to adapt to stress, as in Selye's alarm-reaction theory. If a stress is relentless and the adaptive mechanisms crystallize or set themselves in a pattern of reactive cellular response, the attempts at repair may interfere with the restitution to physiologic or cellular integrity, as one witnesses in the collagenous diseases. Such a process also occurs in the psychopathology of schizophrenia. The symptoms of the emotionally disordered are attempts to combat the alarm reaction of anxiety. If a threat is of disintegrating quality, quantity, or duration, the person will try to respond at the level of integrative operation he has found most effective in allaying the anxiety, and the response may crystallize at that level. The psychotic may react to threat or alarm by a retreat to a level of functioning most "safe" as tested by experience. He may resort to infantile behavior patterns, when overwhelming anxiety breaks through the defenses developed in the course of his emotional evolution. The withdrawal of the schizophrenic into unreality is qualitatively little different from the child's withdrawal into fantasy to satisfy its needs.

FAILURE OF THE DEFENSE MECHANISM

The failure of the organism structurally or functionally to respond to infection or cellular irritants is no different from the failure of the individual, in terms of reaction to disintegrative emotional threats, to meet the initial insult and to re-establish equilibrium. Just as the cellular and biochemical responses to physical insult need not remain static, neither do the emotional defenses need to crystallize and even primitive responses may be reversed when help is given individuals in meeting the threat. Often, so-called schizophrenic symptoms are seen in a patient with acute combat fatigue. A concept of "three-day schizophrenia" grew out of experiences in World War II, where definite psychotic reactions were seen in response to severe internal and external threats. When properly handled, these patients responded by dramatic improvement. A working understanding of the causes of operational fatigue permitted rapid corrective treatment—treatment which did not aggravate the psychologic trauma underlying the disease process. This accounted for the

the mind attempts to maintain its equilibrium and balance (that is to preserve integration and allay anxiety) by mental homeostatic mechanisms. This concept of mental homeostasis stresses the fact that internal as well as external emotional dangers threaten the human organism and evoke an alarm reaction. In addition to threatening external circumstances such as occur in wartime or during a general disaster the individual may experience threats or alarms such as the eruption into awareness of socially unacceptable impulses, fear of rejection, disturbance of conscience and ambivalence toward basic needs. These may be manifested by a feeling of alarm or anxiety. Against this anxiety the individual may develop defenses which appear as inadequate adaptations or as psychiatric symptoms.

THE DEFENSE MECHANISM

The hallucinations, the delusions, the concretistic thinking, the erratic disorganized behavior, the bizarre reactions and many other examples of schizophrenic symptoms are really nothing more than attempts by the disturbed person to maintain integration and equilibrium in the face of catastrophic anxiety. Unfortunately these defenses are frequently out of harmony with the external environment and only lead to further disruption and increased emotional tension. For instance, examples of behavioral defenses against anxiety are found in egocentricity and self aggrandizement. These are generally found to be defenses against the anxiety caused by the fear of rejection. Suspiciousness is really nothing more than an exaggerated defensive alertness, an attempt to handle further slights and hurts. The aloofness and social withdrawal of the schizophrenic is another method by which he strives to obviate the possibility of further hurtful rejection.

We are indebted to the brilliant formulations of Karl Menninger³ who pointed out that a person's reaction to disintegrating emotional threats is to bring into place certain defenses which attempt to meet the threats. To quote Dr. Menninger: "The redistribution of energies made possible by the development of symptoms may enable the individual to re-establish or to develop new integrative relationships of a deviant or compromised kind that provide a measure of stability and comfort. On the other hand we know that symptoms while adaptive in a sense that they discharge tensions perceived as threatening to the integrity of the systems at the same time tend to increase tensions because of their disruptive effect on integrative relationships. Hence it is apparent that an equilibrium may not be achieved and that new and more severe symptoms may be resorted to before semistable equilibrium is achieved."

judgmental, noncondemning attitude, a feeling of human tolerance, and a conviction that the patient's symptoms and his behavior are needed defenses and not undertaken solely to provoke others permit the staff member to develop a healthy attitude toward the patient free of the attitude of contempt, and the desire to punish. A tolerant, permissive attitude, however, is not the only ingredient which is necessary. As Levine⁴ stated, "The tolerant attitude must be combined with a varying amount of firmness, of an expectation of better judgment, and of setting limits in a friendly way to the acting out of unacceptable defenses. A certain amount of such firmness must be pervasive in the therapeutic attitude." Absolute firmness and calm is necessary in the presence of catastrophic anxiety or in cases of panic, or when there is actual danger to the patient or others. A patient afraid of his own ability to control his unacceptable defenses may require great firmness, as an essential aspect of the milieu. Perhaps this is best summed up by the statement that, although we limit the patient in a therapeutic milieu we believe that we are limiting with hope and concern rather than with pragmatism. Our problem is one of transmitting to the patient the assurance that strong, experienced, and mature adults are now attempting to help him solve some of the problems which have led to his anxiety, and that the treatment team, including corpsmen, nurses, social workers, and psychologists, all believe that the patient is capable of learning how to meet his conflicts with increasing confidence and adequacy. To this end, much of the process of aiding the reintegration of the patient is educative and designed to develop adequate, integrated defenses.

METHODS OF CREATING A FAVORABLE MILIEU

I believe that we have a program that has demonstrated the effectiveness of milieu. We are getting satisfactory remissions faster since the concept of the therapeutic effect of milieu has been accepted by the staff. We have demonstrated that a somatic treatment service in an institutional or residential psychiatric center does not have to be a "snake pit" when the emphasis is laid on understanding the patient as an ordinary human being who has reacted to a severe and disintegrating psychologic threat by a disordered mental mechanism and who can and will recover if we are patient and skillful enough. We find a place for deep insulin coma, for electroshock, and hydrotherapy, but not as the only ingredients in our therapy recipe. These are used as one phase of a program and prescribed if the patient is inaccessible to some other form of therapy. In addition to these widely used techniques a dynamic approach to the patient is included in a program of interview psychotherapy, both directive and nondirective, in group psychotherapy, both expressive and didactic, in activity

change in the prognosis of combat reactions. Previously many shell shocked veterans of World War I were treated with electric brushes for hysterically paralyzed limbs. They were kept in hospitals for years long after the cessation of hostilities while the well intentioned neurologists and psychiatrists approached the treatment by attempting to prove to the patient, by stimulation with an electric brush, that they could use their hysterically paralyzed limbs. Lack of understanding of the psychodynamics of the patient's hysteria resulted in the use of a treatment that increased the psychologic trauma to the patient.

MODERN PSYCHODYNAMIC KNOWLEDGE

By using knowledge of emotional psychopathology gained by psychoanalytic research we can analyze and understand all of the patient's symptoms and his behavior. Any pattern of abnormal behavior should stimulate our interest as to just what it is that the patient is trying to do. Not only is it vitally important that the psychiatrist know the full implications of the patient's behavior but it is equally as important that some measure of understanding of human psychopathology and behavior be passed along to nurses, corpsmen and the personnel of the other ancillary services. To accomplish this, corpsmen were selected at this hospital for a four month course of instruction as neuropsychiatric technicians. In this course modern psychiatric nursing, personality development, group activity therapy, leadership and a didactic course of description of the various psychiatric disorders are intensively taught. This and regular weekly staff meetings for each ward have proved to be valuable steps in the building of a therapeutic milieu. It is to the milieu that we assign our improved results in the treatment of the schizophrenic.

If a schizophrenic is treated early and promptly by considerate methods in a milieu where the threats to the already weakened and oversensitive ego are minimized or absent—in a milieu which may even initiate something of an emotional growth process—then the need for pathologic defenses are minimized and the possibility that those defensive reactions will crystallize into established irreversible patterns is greatly decreased. In such instances the chance for restitution to emotional integrity is good. It is unfortunate that all too often the hospitalization, the psychiatric examination and the attitude of attendants and nurses may aggravate the emotional trauma. On the contrary, if all the members of the treatment team are made aware that the patient's behavior is symptomatic, then how different is their attitude toward the patient and how much more meaningful the hospitalization becomes. The patient is in a milieu of acceptance and understanding at all times, not just during the single hour he spends with the doctor two or three times weekly. A non-

VALUE OF THE FAVORABLE MILIEU

One of the aims of modern psychotherapy is to help the patient learn how to remove blocks to his inherent impulse to grow toward maturity and adequacy. Growth in maturity can only occur through emotional experiences and growth in adequacy through an educative social experience. The psychiatric hospital which places its emphasis on custody cannot provide these emotional or social experiences. I believe that both opportunities must be provided for the psychiatric patient in a community matrix, if a permanent result is to be achieved. A cure, from a psychiatric point of view, can be defined as an end result of treatment, where the patient's inherent impulse toward growth in maturity and adequacy is started. The reorganization and reintegration of the personality in a total sense must be facilitated. This phrase "total sense" includes the dimension of current experience, as well as the opportunity for working through or re-experiencing those past experiences that have determined the patient's present emotional status. Most modern psychotherapists are aware that successful treatment in a patient often results from the "working through" or re-experiencing of past experiences, but sometimes we are inclined to forget that therapeutic change also results from current experiences as well. These, because of the pervasiveness of the emotional effect, change the relationship of other current experiences to each other and somehow mitigate the adverse effect of previous experiences on the organization of current living. A therapeutic impact, able to mitigate the pathologic effect of past experiences, is no more likely to occur in an atmosphere of custodial care, punitiveness, lack of respect, and suspicion than it is in a snake pit.

Psychiatric treatment and management during the past 10 years has become less of a speculative mystical process wherein a cure was a matter of chance. It is based more on understanding of the disease process provided by the psychoanalytic theory of personality development. The psychoanalytic method may or may not be applicable in every case, but from the psychoanalytic theory we can find a clue to the patient's behavior that will help us provide a corrective emotional experience instead of stumbling blindly along the path of empiricism, absolving ourselves from blame by sagely commenting about the poor prognosis of the disease. Therapy is possible in schizophrenia. It should aim at the resocialization of the emotionally disturbed individual into an integrated, productive, adequate person, capable of expressing his feelings and of satisfying his deep emotional needs without sacrifice of his fundamental personal gratifications for conformity to external social pressure. To learn to live with one another, working and loving without becoming immobilized in fears, hates, or competitiveness is difficult enough even in a

This operation was necessitated because of recurring attacks of mild intestinal obstruction necessitating several readmissions to the Ninth Evacuation hospital. A roentgenogram showed deformity about the cecum probably due to a previous appendectomy and we believed this could be corrected. The operation was done through the old McBurney incision with Weir extension. A localized occluding angulation of the ileum and a small granuloma were found because in the previous operation the stump of the appendix had been ligated with silk and then buried hence the necessary local resection. This surgery was successful both from the patient's standpoint and also from the fact that this valuable officer was returned directly to his division.

As regards operations for cervical disk and removal of menisci from the knee neither of these procedures should be lightly undertaken and I think it is safe to say that much harm has been done by too wide an extension of the limits of this type of surgery together with improper selection of the time and place. Such patients should always be referred to a base or general hospital for proper evaluation and study.

Surgery is a precise method of treatment and includes more than the operative technic itself. Preoperative care and decision, the operation and postoperative treatment all go to comprise surgery. It should never be done merely for the desire to operate. On the other hand surgery should not be postponed when one is sure that the patient can be helped especially with the added indications that the service itself and the morale of the patient and his unit may be improved by caring for him locally. It has been suggested by some that elective surgery should be postponed until the man is returned to civil life with the thought possibly that he might then report to a doctor as a private patient. This idea needs comment only to condemn it thoroughly.

The good of the patient must always be considered first. His physical and mental well being, his morale and motivation to continue as a member of his unit will settle this question. Finally this question must be answered: Is this the time and place and can we conserve manpower by this elective surgery?

Since the second century A. D. when Galen postulated the doctrine of temperament it had seemed reasonable to suppose that the traits, habits, characteristics, even the attitudes and values displayed by man were intimately related to his physiology. Hence the facile conclusion: To alter physiology is to alter psychology.

—FRANCIS J. BRACFLAND

B l l i / t h N w Y k A d m y / M d

p 765 O c 1953

IS MILITARY MEDICINE A WORTH WHILE CAREER?

M S WHITE *Brigadier General USAF (MC)*

TODAY, upon the completion of another period of instruction in your professional careers, the question uppermost in each of your minds is, "Where do I go from here?" Will the next 18 months be a period that contributes to your professional advancement, or will it be a period of professional stagnation, which some of you may consider necessary because of your citizen's duty to maintain the strength of your nation in these troubled times? The answer will depend on you. We all know you only get as much out of anything as you put into it. Medical and dental educations are not served on silver platters. Your continued progress in the fields of medicine and dentistry will depend on diligent study and a determination to profit from the experiences offered you.

The trait that can probably be of most help to you in profiting from your military service is that of adaptability. The ability to adapt yourself, regardless of assignment, will permit the most to be gained from all experiences and observations. The broadening contacts you will have with all types of problems and people—with representatives of every walk of life and from diverse regions of the nation—will contribute to your continuing education, which in our professions never ends.

VALUES OF MILITARY TRAINING

Too frequently we are not aware of the value of this training at the time we receive it. Illustrating this is a letter I received recently from a young medical officer who entered the service completely inexperienced and was thrust into an assignment as a preventive medicine officer without the benefit of the indoctrination course such as you have completed. He has now returned to civilian practice because of family ties which prohibited his embarking on a regular service career—a career which appealed to him. He wrote as follows: "The 20 months of service, in retro-

F m H d quarters T ct l Air Comma d Langley Air Force Bas V
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spect seemingly a few days have offered this embryo physician an enriching experience that I find difficult to evaluate justly. While the staff has been most generous in its appraisal of my efforts, there is no disputing the fact that I have gained far more than I have given. Preventive medicine as a separate specialty, it is true, has never been my principal professional avocation. The personal advancement I was afforded during my Air Force assignment in that field, however, daily compensated for my lack of desired clinical responsibilities. That advancement in maturity and broadening in social and professional scope which I believe have been my overabundant reward can, in the main, be ascribed to my association with the service."

One of the fortunate experiences all of you are to have in some degree is that offered by the rapidly developing field of aviation. The progress of civil air transportation is rapidly making flight acceptable to ever increasing numbers of our population, which means that our medical and dental professions must orient themselves to the problems their patients will meet in air travel. Your opportunity to practice either directly in the field of aviation medicine or in other related branches of medicine and dentistry should pay dividends in your future military or civilian pursuits. I enjoin you to profit by your experiences and learn all you can of the flight-line activities in the units to which you are assigned. Learn what airpower is and what its potentialities are. As future leaders of your communities, you will find it impossible to take a passive view of your civic responsibilities, and knowledge of the military service will aid you in meeting these responsibilities.

THE SERVICE AS A CAREER

Some of you may decide that you would like to continue in a military career. That is a question that must be answered individually after a careful weighing of all the factors involved and of all the advantages and disadvantages of such a choice. The service can stand on its own merits. The advantages and disadvantages must be evaluated by each person, and the decision to select the service as a career rests solely with him. To a certain extent the advantages and disadvantages of any career depend on the personality of the individual. There are certain persons who wish to plant their roots in one community and remain there for the rest of their lives. These people would be very unhappy in the service, and I would recommend that they do not consider it. In my opinion this is the only disadvantage of the service, and it is a disadvantage only to the type of person described. To others, travel—the opportunity to meet new people, to see new places and to experience new adventures—is one of the distinct advantages of the service as a career.

When properly evaluated, all other aspects of service life are found to possess marked advantages over civilian life. Frequent criticisms directed against service life are made by the uninitiated or by those who make up our services in time of war. In wartime everyone's life is disrupted, so an improper comparison is made. Much of this criticism has been directed at such aspects as pay, home life and family, professional advancement, insecurity, and frequent moves. Actually the honest analysis of these criticisms will reveal that most are in error, and are leveled against aspects which in reality are desirable features of service life.

SOME CRITICISMS REFUTED

In regard to pay, it compares very favorably with civilian remuneration when increases through the various grades and over the years are considered. No part of military pay need be expended on the additional items which are a constant drain on the incomes of civilian physicians. I find that I live better and have an income greater than most of my classmates of medical school of 22 years ago, and this is in spite of the fact that when we entered the service we selected a military career because of its way of life, not because of any monetary return. All officers in those days expected to live in so-called genteel poverty, but still to live constructively and happily, dedicated to the services of their country.

The ill informed person frequently criticizes the type of home life in the service and the difficulty of rearing a family. In normal times the service offers ideal conditions for home life because each base is a small town family of well selected members. It must be remembered that in wartime frequent moves and lack of housing were not experienced by service personnel alone. Pre-war standards, when attained again in the future, will undoubtedly provide housing similar to that available to career service personnel in the prewar years.

Rearing children in the service is one of the real rewards of military life. Service children usually are more mature, more precocious, and better and more broadly educated than their civilian contemporaries. The advantages of travel and the broadening influence of contact with all types and races of people prepare them better for life.

Professional advancement and practice, which is frequently criticized in the service, is one's own responsibility. Opportunities exist to go as far as he desires if he exercises a diligent and aggressive approach to training. Along with many others in the services, I have been given the opportunity to progress in medicine to and beyond the stage of certification by the American

Boards of Internal Medicine and Preventive Medicine When for training courses are taken, whether for one week three months or three years the service officer still retains his normal income and need not worry about losing his patients or his practice during the period of his absence. Few civilian practitioners can afford to break their professional ties in order to complete their postgraduate education. In the Air Force, those entering the specialized field of aviation medicine will have the stimulating experience of pioneering in a new frontier of science and all the services provide ideal environments for other recreational activities.

Frequent moves, often criticized, were a result of wartime necessities and emergencies which affected everyone's life. Normal military service, such as we hope to expect in the future, will mean moves other than those desired by the individual himself for training or other purposes, about every three or four years.

Recently, criticism arose because of an officer's inability to resign his commission. In the past one could resign at any time but during the wartime emergency this naturally was discontinued. The Assistant Secretary of Defense (Health and Medical) has announced his intention to support a policy which would permit resignations of medical service officers from the regular service. This will again permit development of a voluntary medical career corps appreciative of what it has, and which, in time, will be a well selected group.

PROFESSIONAL AND ECONOMIC INDUCEMENTS

We never hear criticism or discussion of the other advantageous factors of the service: the appeal to the spirit of adventure, a happy contented stimulating healthy highly motivated and productive way of life, or the satisfactions attending a professional practice free of the many irksome disadvantages met with in civilian life. During vacations and off duty time an officer is free of all cares of practice. These are usually not discussed but are certainly important in an overall evaluation for selecting a career. For those who are security minded and who actually wish to weigh the dollars and cents value of the service, sickness and retirement benefits can be mentioned. But everything else so outweighs the conditions of civilian life and practice that it seems superfluous to topple the scales in this manner. The security benefits are illustrated in the story told me by a young dentist leaving the service last month. He said that if his wife had approved he would have applied for a regular commission as he loved the service and the manner in which it allowed him to practice his profession. But his principal

reason for staying, figured out by himself and another dental financial genius, was the amount of work they would have to do at a dental chair each week in private practice until retirement to build up an annuity equivalent to what they would get out of military retirement. They found that there were not enough hours in the day to do this, and knew that in the future they would longingly look back to military service.

MILITARY SERVICE AND FAMILY LIFE

This brings up the question of demonstrating to the wives of our professional people the advantages of the service. Too frequently their only experience of service life is of poor living conditions in a crowded community, away from a base and the normal associations of service life. If they realized this was only a temporary situation, overcome in the long range picture of a service career, and were aware of the advantages of model communities, good home life, lifelong friendships, good schooling for their children, and the regular companionship of their husbands, they would probably quickly insist that their husbands apply

There are many other so-called "fringe benefits" we hear about these days and, though important, they do not merit discussion here. Moreover, in the long range career picture I am sure an appreciative citizenry and government, which it is our lot to serve, will take the necessary steps to restore these rights and privileges and to advance further the prestige of service life.

AN INDIVIDUAL CHOICE

Each of you must determine what you want out of life and how you can best live it, at the same time making full application of your talents to contribute to the general welfare of the nation and humanity. Those who believe they can meet the rigid requirements of the regular service, and who are accepted by the service as suitable, will find that they have chosen a rewarding way of life. In the long run, I am sure it will make them the envy of all their colleagues who are bound down by civilian pursuits. The choice rests with each of you after carefully weighing all factors.

I wish you all Godspeed in your separate journeys to your stations, and trust your period of service will be one that you can always pleasantly look back upon as a further step in your professional advancement, unmarred by another war. But uppermost in our minds must be the knowledge that the services exist for only one function—the protection of the nation in the event of war.

DENTAL APPOINTMENT PROBLEMS AT SEA

FRANK N ELLIS *Lieutenant (DC) USN*

FROM the day he reports until he is relieved, the dental officer on independent duty aboard ship will have one persistent, ever present problem—how to distribute his talents in such a way that each of those requiring his services will receive a fair allotment of time for dental care. On a ship with the complement of a cruiser this is a complicated problem, because usually, for every man who can possibly be squeezed into the schedule, there are several in need of treatment. Sometimes it takes the wisdom of a Solomon to decide how the dental officer's time should best be used.

AVAILABLE METHODS

The keystone of any plan for allocating dental time is in the method of making appointments. Since reporting aboard ship for duty two years ago, I have tried or personally observed the following methods of making appointments:

1 Appointments are made for one day at a time only. All persons desiring treatment report to the dental office after morning quarters, when the dental officer selects those he can treat on that day. All others are ordered to return to sick call again the following day.

2 All the men on the ship are given a dental examination, and patients are called in on the basis of need.

3 All patients reporting to dental sick call in the morning are given appointments even though this may result in booking ahead three to four months.

4 All men seeking treatment are required to report between the hours of 0800 and 0900 at which time a working dental record is made and the permanent record is brought up to date. Any condition requiring emergency care, is treated immediately or later the same day. If follow up treatment is indicated, an appointment is made within a 10 day period. If dental care can safely be postponed the patient is advised to report again in 30 days, at which time he will be given an appointment no more than one week in advance.

From U. S. S. *Quincy*, FPO San Francisco Calif.

INADEQUATE METHODS

As well as being wasteful the first of these four methods is unfair because those with time to squander standing in line are given an advantage over those who though equally deserving are busier. I have seen this method used and although it may answer the problem of booking patients too far in advance it does not provide a balanced dental service for all hands aboard ship.

Theoretically the second method should be the ideal one and if a dentist were to be sent to sea with 400 to 600 men I think it might also be the practical solution. On a cruiser with only one dentist assigned however, the problem consists of providing dental care for from 1 400 to 1 600 men many of whom have long standing dental deficiencies. If one also considers the fact that this crew of 1 400 men is not static but constantly changing and that the new men reporting aboard will provide a constant flow of additional patients it can readily be seen that the mechanics of examination and of making and cataloging working records alone will occupy a great deal of one dental officer's time. Emergency treatments which cannot be postponed will take two working hours a day and these patients must be provided with follow up appointments.

The third method apparently providing equitable care for all does nothing of the kind in actual practice. I found in my attempts to use this method that soon I was booking as much as three months ahead. This system results in impossible situations as there is no way of knowing the ship's operating schedule so far in advance. Because no provision can be made for adjusting the schedule in the event of early liberty for the crew in foreign ports general quarters field days special inspections rough seas et cetera the appointment list soon becomes meaningless. Most dental appointments made this far in advance are probably forgotten anyway.

THE METHOD OF CHOICE

The fourth method and the one at which I finally arrived by a process of trial and error is a compromise with the others. It has the advantage of providing dental time for those persons in need of urgent treatment and also of giving a reasonable number of appointments to others requiring routine work.

All men reporting aboard ship either bring with them an up-to-date permanent dental record or one is made for them immediately before the dental administrative assistant signs their check-in sheet. Working records are provided at the time men report to sick call either for emergencies or to request dental appointments. At this point the dental officer may give appointments to men with the most urgent dental needs. If the appointment list grows short

however it is possible to add the names of men who need only routine care. If the workload of urgent care is too heavy, the man with routine needs is asked to return in 30 days when every effort will be made to provide him with his next appointment within a week.

I have found that in practice this method yields the most satisfying results. Urgent cases are cared for within a short time, routine cases are projected over a longer time span, but, although delayed, are eventually completed. Our books are not cluttered with a hopeless maze of appointments stretching into the dim future, and our sick call line is moderate. Best of all, each man is given the feeling that he is receiving his share of the best dental care the ship can afford.

SUMMARY

Although no method of providing dental care will work perfectly in a situation where the dental workload is excessive, it has been found that by careful attention to the method of making appointments a great many evils may be avoided and reasonably adequate care can be provided for all hands. The method selected allows the dental officer to concentrate on personnel in need of urgent dental care, and to spend the remainder of his available time on routine work. The appointment list should not extend into the future for more than two weeks.

Health and the Individual

Before I know what is health in a person I should like to know what goes to make up his totality. Is the poetry of Keats as much a part of him as were his lungs? Are the intelligence, character and personality as much a part of a man as his limbs? If by losing the power in his limbs he gains in those other qualities, has there been a total loss or gain in health? Sir Owen Dixon in his Arthur C. Mills Oration quoted Wendell Wilkie to the effect that the qualities which the late President Roosevelt's misfortune had called forth and the conditions of life that it imposed had indeed been a source of strength—they had contributed to the President's success. Which then was the healthy Roosevelt? The man who could walk or the man in the wheel chair with his mental powers enhanced by his paralysis?

—W. J. SAXTON

in Medical Journal of Australia
p. 558 Oct. 10, 1953

SAMARITAN IS FIRST AIRCRAFT DESIGNED EXCLUSIVELY FOR EVACUATION OF PATIENTS

The Military Air Transport Service has accepted delivery of the first of a fleet of 20 new C 131A aircraft which have been built for the exclusive use of patient air evacuation. Known as the Samaritan, the plane is a special version of the twin-engine Conquest air currently used by commercial airlines.



Shown is the equipment aboard the new C 131A aircraft. Brigadier General William H. H. USAF (MC) is the Surgeon of MATS and Captain Robert F. C. (MC) USAF is the Surgeon.

The new evacuation aircraft is pressurized and air conditioned in flight. It has a cruising speed of 235 miles per hour, a service ceiling of 24,000 feet, and a range of over 1,600 miles. Passenger seats face aft and are secured with a force of 9 g. Special features include a buffet with refrigeration for preparation of meals aloft, a flight nurse's desk, glare-proof windows, modern communication system, and a new type nylon litter tape. The C 131A carries two pilots, a flight nurse, and two medical attendants in addition to 27 patients in litters or 12 patients in litter and 20 seated.

Giant Follicular Lymphoma

PAUL O WELLS *Colonel MC USA*

THE following case of giant follicular lymphoma of 22 years' duration, with biopsy evidence of its presence for 13 years, is reported because of the long survival of the patient following onset of the disease. A review of the literature discloses other reports¹⁻³ of long survival.

CASE REPORT

The patient was a 65 year old woman who was admitted to this hospital on 11 March 1952 because of abdominal pain and shortness of breath. In 1929 she had enlarged cervical and left inguinal lymph nodes for which she received x ray therapy with prompt regression of the nodes. In October 1931 she had bilateral recurrence of enlarged nodes in the cervical and inguinal regions. The mediastinal nodes were also slightly enlarged. The clinical diagnosis at this time was lymphoma. She was given x ray therapy to the left inguinal region (about 3 000 r (tumor dose) in 13 months). The mediastinum and cervical region received a much smaller total dosage and prompt regression of the lymph node enlargement occurred. The patient was then asymptomatic until February 1939, when a small (1.5 by 2 cm) mass was noted in the region of the right parotid gland. This was excised and histologic examination revealed a lymph node showing changes characteristic of nodular lymphocytoma (Brill Symmers disease) (fig. 1). Postoperative irradiation was given to the operative site.

In 1940 the patient was again treated as an outpatient for lymph node enlargement in the left inguinal region, and this promptly regressed after small doses of roentgen rays. During the subsequent years, the patient had numerous recurrences involving isolated or small groups of lymph nodes which responded promptly to small doses of roentgen rays.

In January 1948 a rectal polyp was removed and on histologic examination showed adenocarcinoma. Exploratory laparotomy at that time did not reveal any residual rectal lesions, but there were numerous small, gray nodules in the liver and spleen, varying in size up to 2 cm in diameter. A biopsy of one of the

¹ From the Army Hospital, San Francisco, Calif.

liver nodules contained the regular architecture of the liver disrupted by masses of giant lymph follicles (fig 2). The diagnosis at this time was aleukemic nodular lymphocytoma metastatic to the liver. A dermoid cyst of the ovary was also removed. Postoperative irradiation (a total dose of 1,125 r (air)) was given to two adjacent upper abdominal areas over a 90-day period.

From June 1949 to August 1951 the patient was periodically treated with small doses of irradiation for enlarged discrete



Fig 1 Lymph node biopsy (1939). Section showing large follicles with normal architecture (x 70).

nodes about the face and neck which promptly shrank in size. Throughout this time her general physical condition remained good.

In January 1952 her condition changed with rapid enlargement of the supraclavicular, left inguinal and anterior mediastinal nodes, and a small pleural effusion on the left. The liver and spleen were considerably enlarged. Biopsy of a cervical node at that time revealed malignant lymphoma. Irradiation of the involved areas again gave a prompt response with regression of the nodes and resorption of the pleural effusion but there was a

rapid recurrence of the node enlargement and the patient's condition declined rapidly

On her last admission to the hospital, the patient complained of increasingly severe abdominal pain, anorexia, and dyspnea. Breath sounds were decreased to absent over the lower third of the left lung field. Her abdomen was distended and diffusely

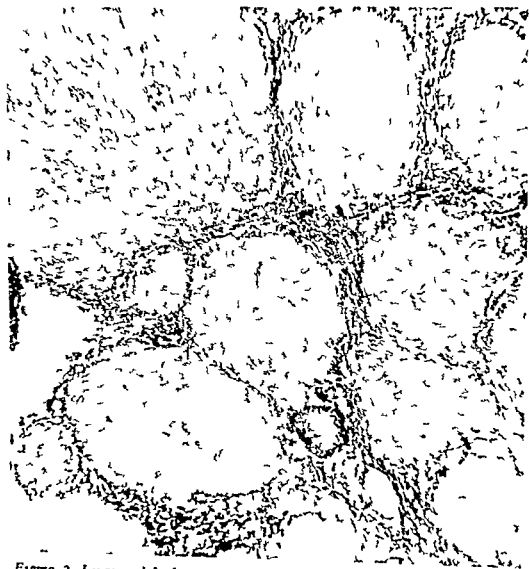


Figure 2 Liver nodule biopsy (1948) Section showing marked disruption of the liver architecture by giant lymph follicles ($\times 35$)

tender. The liver was palpable 7 cm below the left costal margin and was irregular and nodular. There was generalized anterior cervical and submandibular adenopathy, and the left supraclavicular nodes were markedly enlarged. The peripheral blood showed only a mild hypochromic anemia. A roentgenogram of the chest showed a large pleural effusion on the left and markedly enlarged mediastinal nodes. There was progressive deterioration

in her condition. A course of triethylenemelamine failed to benefit her, and on 28 March 17 days after admission she had a large hematemesis and died the following day.

At autopsy the most significant gross findings were generalized lymphosarcomatosis, bilateral pleural effusion, acute gastric ulcer and hydronephrosis with hydroureter on the left



Fig 3 Spleen at autopsy showing extensive nodular tumor infiltration

side secondary to obstruction of the ureter by a lymphosarcomatous mass in the pelvis. The spleen in particular showed numerous large white tumor nodules (fig 3). The liver, kidneys (fig 4) and pancreas were extensively involved and histologically were identical with the malignant lymphoma in the lymph nodes. The intestinal tract was extensively infiltrated with



Figure 4 The kidney at autopsy showing tumor nodules

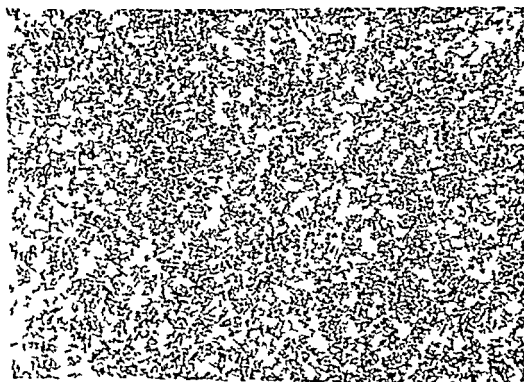


Figure 5 Section from lymph node removed at autopsy showing complete destruction of the normal node structures and replacement with a pleomorphic aggregate of malignant lymphoma cells ($\times 150$)

tumor tissue, but was not obstructed. The brain and lungs were free of tumor involvement. Bone marrow taken from the lumbar vertebrae and ribs showed hypoplastic marrow, but no lymphoma infiltrate. The following is quoted from the autopsy report:

Microscopically the neoplasm presented the monotonous pattern of a lymphosarcoma, portraying no resemblance to the typical giant follicular tumor observed at previous biopsy. Variation in lymphoma cells and nuclei is moderate; many cells appear to be mature lymphocytes, and there are large numbers of indented and convoluted nuclei. The neoplasm is considered to be a lymphosarcoma and with the predominance of well defined vesicular nuclei, numerous mitoses and an occasional nucleolus to satisfy the description of lymphoblastoma (fig. 5).

DISCUSSION

This disease is generally considered to be a member of the lymphoma lymphosarcoma group. The essential pathologic change is markedly enlarged follicles packed uniformly with lymphocytes or their precursors or rarely reticulum cells. The marked radiosensitivity of the lesions is shown in this patient where tumor doses as low as 900 to 300 r were sufficient to cause regression of lesions. Even after the lesions had changed into a more malignant form there was prompt regression of the enlarged nodes after small doses of irradiation although they recurred within a few days. Rubensfeld calls attention to the fact that larger doses (2 000-3 000 r) are required in treating the "polymorphous cell sarcoma" which develops from the giant follicular lymphoma. He also noted a latent period of from two to six months before they responded to the treatment. His five-year survival rate in the two conditions was 60 percent and 66 percent respectively. The reported incidence of this disease varies with different authors. Gall and Mallory's³ series of 618 cases of lymphoma included 49 patients with follicular lymphoma. Ehrlich⁴ quoted Custer as stating that there were 110 cases of giant follicular lymphoblastoma in 1,190 cases of malignant lymphoma examined at the Armed Forces Institute of Pathology between December 1941 and 2 September 1945; an incidence of 9.2 percent.

This patient illustrates the usual relatively benign course of the disease until such time as it changes to a more malignant form. Cohen and Bergstrom⁵ assert that giant follicular lymphadenopathy may show regression to normal, intermittent recurrence or change to any of the following: Giant follicle lymphoblastoma, lymphosarcoma, lymphatic leukemia, Hodgkin's disease, polymorphous cell sarcoma, or reticulum cell sarcoma. On the other hand, Call and associates⁶ report 63 cases of this disease of which only one changed to another member of the

lymphoma group, lymphoblastic lymphoma. However, the cases in their series are divided into four types on the basis of histologic appearance. Extensive deformity of the follicles with considerable atypicality and dedifferentiation of the cells placed the lesions in type 4. Transition from one type to a more advanced type was commonly noted by them. Symmers⁹ also noted that giant follicular lymphadenopathy may undergo transformation into a form of generalized sarcoma of lymph nodes. Uhlmann¹⁰ called attention to the frequency of confused terminology on his histologic reports. Several cases in his series had been previously diagnosed as "atypical sarcoma," "atypical Hodgkin's disease," or "aleukemic leukemia." The disease entity has now become so well known that this should be uncommon in the future, but confusion in terminology used in classifying the various disease entities involving lymph nodes still exists.

Prognosis in patients with giant follicular lymphoma is significantly better than it is in patients with other diseases of the lymphoma group. Over 50 percent of the patients can be expected to live over five years after diagnosis is made.¹⁻⁵ Permanent cure is rare with the present methods of treatment.

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Hysterectomy is a procedure that should never be undertaken lightly or inadvisedly. It should be done only when one is certain that no simpler method of relief is possible and the end results justify its performance. By following these basic principles one will never be guilty of unnecessary surgery.

—C. GORDON JOHNSON, M.D.

in *Journal of the Kansas Medical Society* p 418 Sept 1953

Ophthalmomyiasis

KARL F MENK L t na t (MC) USNR

BONNIE E SMITH Ch f Ho p tal C p ma USN

MAX G RIEVES H p t l C p man, th d l USNR

MAGGOTS of flies occasionally infest the human body and when the eye is involved this condition is known as ophthalmomyiasis.¹ Although over 100 cases of ophthalmomyiasis externa have been reported the occurrence of a case in Anne Arundel County Md is unusual because of the geographic location. Ophthalmomyiasis externa designates those cases in which larvae are found within the orbit but external to the globe. The terms ophthalmomyiasis interna and ophthalmomyiasis interna posterior describe those cases in which larvae are found in the anterior and posterior chambers of the eye respectively. Ophthalmomyiasis externa is uncommon in the United States but occurs frequently in Russia North Africa and Palestine. A case in Texas and another in Arizona have been recorded in which the larvae of *Oestrus ovis* was the offending agent. The larva in this case was of the same species.

CASE REPORT

On 2 October 1953 a 14 year old boy was seen in the dependent clinic of this hospital complaining of bugs in the eye. The boy was a resident of Annapolis and had not traveled from the community. He stated that two days previously a flying insect had hit him in the eye. The day prior to examination he had complained that the eye was sore, and his mother had seen three small wormlike motile particles in his left eye. When he was examined at the clinic one of these small larvae was removed from the conjunctival sac and sent to the laboratory for identification. The cornea and internal eye were clear and free of invasion and the conjunctiva tear sac and nose were normal. The laboratory reported that the specimen submitted was a motile first stage larva of the species of *Oestrus ovis* (Linnaeus) (fig 1).

The conjunctiva was anesthetized with 1 percent tetracaine hydrochloride (pontocaine) solution the larvae removed and the eye vigorously irrigated with 2 1/2 percent boric acid solution. The patient was given 1:5000 benzalkonium chloride (Zephiran) and 1:10000 epinephrine eye drops for use at home and was re-

quested to return for a follow up examination three days later. On return the patient's eyes were normal and without evidence of inflammation. No further trouble was experienced.



Figure 1 Larva of *Oestrus ovis* removed from conjunctiva of patient ($\times 200$)

DISCUSSION

Oestrus ovis (sheep botfly or gadfly) has an ubiquitous distribution and is found in association with sheep or goats, which are its normal hosts. It is a large (10 to 12 mm in length) dark gray fly with dark spots on the dorsum of the thorax and abdomen, and is covered with a moderate amount of light-brown hair.³ In the area about Annapolis there are a few small goat herds, and the fly is known to inhabit this area. Man is not the normal host but is often infested. Infestation usually occurs during the summer or early fall. The gravid female darts into the conjunctiva or nares and deposits first stage larvae. Because the parasite can not develop in the human, the infestation lasts but a few days and may cause conjunctivitis which is painful but not serious. As many as fifty larvae have been reported to have been removed from the conjunctival sac of a single patient.

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Medical Problems of Civil Defense

The carnage of an atomic blast on a city would make even Napoleon's debacle at Waterloo or the British tragedy at Dunkirk seem like a minor catastrophe. Within the capabilities of field weapons so far used a 10 percent loss in 24 hours of battle is a generous estimate. In an atomic attack on a city the casualties could run from 25 to 50 percent of the population not in 24 hours but in 24 minutes or less.

In the field we have highly trained, disciplined, and organized units fully equipped to carry out battle or campaign objectives. Teamwork is developed to a high degree of perfection, and even in the confusion of battle there always is control. In civil defense there may be training and organization but all on a volunteer basis. Discipline can come only through the highest development of volunteer leadership and service. While an army unit has a medical table of organization to care for the maximum number of estimated casualties, even our largest cities cannot hope to provide sufficient professional medical personnel for the adequate care of the number of casualties that we must envision under atomic attack. The Army also has the required equipment and supplies and facilities to meet estimated casualty requirements. In civil defense we cannot even dream of such abundance of supplies, equipment, and facilities.

Even in World War II, now considered a long time ago, if our wounded had excellent care. We had highly trained and specialized surgical teams almost up in the front lines. Farther back we had field hospitals, then mobile evacuation hospitals, and the fully equipped general or base hospitals. Aside from those we still had the great hospitals in this country. Collection and evacuation of the wounded always through professional medical channels was extremely rapid, orderly, and definite. In civil defense such organization in depth is just not possible. In the field we have only one front line; in civil defense every major city could be its own front line within a few hours! There might be no place to fall back and little or no reserves to call on.

—J F MORE

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Spontaneous Hemorrhage Associated With Pericoronitis

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THE occurrence of spontaneous hemorrhage from pericoronitis is an unusual complication. In the case reported treatment not usually rendered in the first stages of pericoronitis was required.

CASE REPORT

A 20 year old man was first seen at the dental clinic at 0900 on 30 July 1953. His chief complaint was bleeding from the mouth, with pain and soreness in the left side of his jaw and neck. The onset of symptoms was 48 hours prior to his appearance at the clinic, and was characterized by pain in the left side of his jaw. This became increasingly severe during the intervening period. About 0430 on 30 July 1953 the patient was awakened by bleeding from his mouth which continued until he reported to the clinic. At times during this four and one half hour period, several large clots were expectorated. The patient had delayed requesting treatment because, by coincidence, he had an appointment for this day and waited until the scheduled time to report.

Physical examination revealed a well developed and well nourished man. There was slight swelling near the angle and beneath the border of the left side of the mandible, and the cervical and submaxillary lymph glands on this side were enlarged and tender. Partial trismus, general malaise, some nausea, and a temperature of 99.6 F were present.

Oral examination revealed a blood clot about two inches long and one inch wide extending from the area of the unerupted lower left third molar tooth. About one half of the occlusal surface of the third molar was exposed. The tissue around and over the tooth was red and enematous. The bleeding was from between the third molar and the gingival flap, apparently deep in the pericoronal space around the crown of the tooth. The opposing teeth of the maxilla did not contact the tissue in this area during any movements of the mandible.

Our first impression was acute pericoronitis indicating conservative treatment. The blood clot was removed and the oral cavity well cleansed. After several methods of hemostasis had failed a small strip of oxidized cellulose was inserted under the gingival flap around the crown of the tooth and biting pressure applied with a wet gauze over the area. The bleeding stopped momentarily. The patient was given 300 000 units of penicillin G procaine intramuscularly sedation and instructions for home care. Before the patient left however profuse bleeding recurred. The same method was repeated several times without success.

Laboratory tests revealed that the clotting time was two minutes and 20 seconds and the bleeding time was three minutes and 10 seconds both within the normal limits. Urinalysis was negative. The blood cytology was normal except for a leukocytosis of 12 250.

Roentgenographic examination showed the involved tooth in satisfactory vertical position with fused, cone shaped roots having little curvature.

After considering all the findings the decision was to extract the lower left third molar. A mandibular block was obtained with 2 percent procaine hydrochloride and the tooth was extracted without difficulty. The remnants of the dental follicle were removed leaving a clean socket with no ragged edges. Hemostatic absorbable gauze was inserted gently and loosely to cover completely the opening of the socket, and light biting pressure applied. The bleeding stopped immediately.

The patient was admitted to the infirmary. He was placed on a liquid diet and penicillin and sedative therapy was continued. His condition improved steadily with no recurrence of the hemorrhage. The third day he was asymptomatic and was discharged to duty.

SUMMARY

An unusual case of spontaneous hemorrhage from an acute pericoronitis is reported. After several unsuccessful methods of hemostasis the involved third molar was extracted, a treatment usually contraindicated in the first stages of a pericoronitis. Hemostatic absorbable gauze and penicillin therapy were employed and recovery was uneventful. The pathologic process in this case is assumed to be infection that eroded a blood vessel thereby producing a nonself limiting hemorrhage.

Use of ACTH in Gas Gangrene

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REPORTS on the use of ACTH in the treatment of infections are numerous, but it has not been possible to find any report of a patient with gas gangrene who received this hormone as an adjuvant in treatment.

CASE REPORT

A 21 year-old soldier was admitted to this hospital on 10 October 1951 with penetrating missile wounds of the left leg and foot, right thigh and leg and left hand and forearm. His injuries had occurred about 40 hours before admission, and he had been treated at a forward mobile army surgical hospital.

The patient was acutely ill. His temperature was 101 F, pulse, 90 and blood pressure, 118/82. His right thigh and leg were more painful and swollen than the left leg. Localized areas of crepitation were present in the tissues immediately above and below the right knee joint. A roentgenogram of the right lower extremity showed a compound comminuted fracture of the right tibia and fibula as well as bubbles of gas in the soft tissues below and above the right knee joint.

The white blood cell count was 16 000 with 82 percent neutrophils and 18 percent lymphocytes. Hemoglobin was 15 grams per 100 cc. Smears and cultures from the draining wounds were positive for *Clostridium welchii*.

The patient was given 200 000 units of aqueous penicillin in 5 percent dextrose and normal saline solution intravenously, 300,000 units of penicillin intramuscularly, therapeutic doses of polyvalent antiserum and 50 mg of meperidine hydrochloride (demerol). A right mid thigh amputation was performed under inhalation anesthesia. The patient received 1 000 cc of blood during the operative procedure of one and one half hours. His blood pressure was within normal limits during the entire operation. One hour after the operation the patient suddenly developed shock. He was semiconscious with a blood pressure of 80/50, cool clammy skin, a pulse rate of 130, and temperature of 105 F.

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ACTH was given in addition to penicillin repeated blood transfusions and therapeutic doses of polyvalent antiserum. During the first 12 hours 20 mg of ACTH was given every four hours, and then given every eight hours.

After 12 hours the patient was greatly improved. His temperature dropped to 98.4 F, blood pressure rose to 128/78, pulse rate dropped to 78. He was able to sit up in bed, and asked for something to eat. His improvement continued and after 72 hours the ACTH was gradually decreased and finally stopped.

DISCUSSION

The postoperative shock and fever in this patient, probably representing severe intoxication from bacterial products, responded unusually rapidly. In this patient ACTH may have had a dual beneficial action. First as mentioned by Finland and associates¹ and Kinsell, the cortical steroids exert an antitoxic and non-specific insulation effect on the cells which may have prevented the toxic actions of bacterial products. Second the cortical hormones may have aided the restoration of vascular tone.

It is believed that, although antibiotics, surgical intervention, blood and antiserum are the foundation of gas gangrene therapy, ACTH can be a valuable adjuvant.

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Control of Typhus Fever

For over four centuries classic louse borne typhus fever has occurred wherever countries have suffered from overcrowding and famine due usually to war or occupation by enemy troops. In the past its presence often decided the fates of armies and countries. But the experience in North Africa and Naples followed by that in Germany and Japan has showed that a mass epidemic even in the worst conditions can be curtailed and controlled by the use of insecticide and rigorous discipline.

—C V HARRIES Surg. on Command R N

J. nat. of the Royal Naval Med. Serv. p 155 Summer 1953

Sclerema Neonatorum Treated With Cortisone

ALLY HARRIS, M.D. (M.D. 1944)
FRANK J. HARRIS, M.D. (M.D. 1944)
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EARLY recognition of sclerema neonatorum followed by the prompt institution of steroid therapy assumes great importance as the result of two recent reports^{1,2} indicating that treatment with either cortisone or ACTH may be strikingly effective. Excluding the mortality rate in those cases reported prior to the institution of corticosteroid therapy was 75 percent. Three additional cases in which there was notable improvement following the addition of cortisone to the therapeutic regimen are presented in this report.

CASE REPORTS

Case 1. A white female infant, weighing 5 pounds 11 ounces, was delivered by outlet forceps following a 19 hour complicated labor. The second stage of labor lasted 4 hours 10 minutes because of an arrested transverse cephalic presentation which was eventually corrected by manual rotation. The mother was a 27 year old primigravida whose pregnancy had been uneventful. The Kahn test was negative and her blood was type A, Rh positive. Following rupture of the membranes, the amniotic fluid was noted to be meconium stained. The infant was apneic for one minute after delivery and effective respiration was not established for two more minutes. The cry was weak initially, but no cyanosis was noted. Oxygen by mask and caffeine sodium benzoate were given in the delivery room. On admission to the nursery, the rectal temperature was 95.2° F and the cry was still weak. The initial physical examination revealed absence of the startle (Moro's) reflex and an excessive amount of mucous material in the mouth and pharynx. During the next 24 hours, the infant developed a generalized hypertonicity to such a degree that the possibility of central nervous system bleeding was considered and a lumbar puncture was done. This revealed xanthochromic spinal fluid containing 89 red blood cells and 1 white blood cells per cu mm. The serum calcium was decreased at this time to be 10.5 mg per 100 cc.

During the second day the skin began to take on the characteristic woody consistency seen in sclerema and the infant's general condition continued to deteriorate. She regurgitated even small amounts of clear liquids which were given and a brief episode of cyanosis was noted.

The typical increased consistency of the skin seemed to involve the lower extremities first spreading rapidly to become generalized though remaining so marked on the lower extremities and buttocks that movement of the legs seemed impossible. Skin bound was Underwood's original description of such an infant.

When the patient was about 60 hours old and seriously ill 10 mg of cortisone was given every eight hours for the first day then every 12 hours for the next six days. Within 12 hours the skin on the face and arms began to soften and fluids given orally were retained. During the next week the skin steadily became more pliable until it was completely normal except for the very minimal firmness in the gluteal regions and she was discharged when 15 days old. Physical examination at this time revealed an apparently healthy infant. This patient was last seen in the outpatient department at 10 months of age and was developing normally.

Case 2 A white male infant weighing 4 pounds 8 ounces was delivered spontaneously after three hours of labor and following a gestation of 34 weeks. The mother was a para 1 gravida whose prenatal course had been uneventful. Her blood was group A Rh negative. An anti Rh titer done two months prior to delivery was negative. No satisfactory explanation for the premature onset of labor was determined. Nitrous oxide oxygen and a pudendal block with 2 percent procaine were used in the delivery. The infant's initial respirations were delayed for about 30 seconds and manual resuscitation was given during this period.

On admission to the nursery the infant was cyanotic with a weak cry and the rectal temperature was less than 96° F. Respirations were shallow and irregular and there were coarse rales throughout both lung fields. He was placed in an oxygen unit and the gas supplied at six liters per minute and 60 percent humidity. His color became pink and his condition appeared improved. Nothing was given orally. A specimen of cord blood taken at delivery was group A Rh negative the Coombs test was negative. A roentgenogram of the chest revealed prominent vascular markings which were thought to be consistent with those seen in a neonate.

After 18 hours the infant became apneic and cyanotic. caffeine sodium benzoate and artificial respiration were administered.

Spontaneous respirations were resumed shortly thereafter. At this time, an unusual firmness of the skin was first noted. This hardening progressed rapidly until it was generalized. The face was so markedly involved that the infant seemed unable to open his mouth when he tried to cry. It was our impression that the clinical picture was consistent with sclerema neonatorum, and 10 mg of cortisone acetate and 50 000 units of aqueous crystalline penicillin every six hours was started. During the following two days, there was no essential change in the patient's clinical condition but on the fourth day he seemed more active and was able to take and retain small amounts of 5 percent dextrose in water. The rectal temperature finally stabilized at 99 to 99.2 F, the body weight had dropped to 3 pounds 12 ounces. By the sixth day, the respirations had become fairly regular. The color continued to be good and the skin and subcutaneous tissue was definitely softer and more pliable. Cortisone was then decreased to 10 mg every eight hours and was continued at this level for another two days when it was discontinued. The infant received 260 mg of cortisone acetate in seven days, and the course was uniformly favorable. By the eighth day there was only mild induration of the cheeks, the skin and subcutaneous tissue of the remainder of the body having a completely normal appearance and consistency. At two weeks of age even the slight facial induration had disappeared. The infant was discharged on the thirty-sixth day, weighing six pounds. Physical examination at discharge revealed no abnormalities. He was last seen in the outpatient department at the age of two and a half months, weighing 10 pounds 12 ounces and was normal.

Case 3 A white male infant weighing 4 pounds 2 ounces was delivered by outlet forceps following a six hour first stage and a 29 minute second stage labor. The gestation was about 36 weeks. Respirations were delayed for about four minutes during which time the infant was extremely cyanotic. Manual resuscitation, an insufflator and caffeine sodium benzoate intramuscularly were used to initiate breathing.

On admission to the nursery the patient's rectal temperature was 98.8 F. He was given oxygen administered at six liters per minute in a closed unit. The physical examination revealed no abnormalities. Because the membranes had ruptured prematurely, penicillin and streptomycin were given; these were later changed to terramycin. During the next two days, feedings were withheld and the infant was disturbed as infrequently as possible. He became increasingly lethargic. Although crackles were heard at both bases, his color remained good.

Sclerema was first noted on the third day and induration of the lower extremity which failed to pit on

In addition the infant's movements were slow and stiff. Ten milligrams of cortisone every six hours was begun immediately. In the next few hours the induration spread to involve the trunk and upper extremities. The cortisone was maintained at 10 mg every six hours for three days and then decreased slowly for the following five days. The total amount given was 195 mg.

Increased spontaneous activity and reaction to painful stimuli which were almost completely absent previously were noted after 36 hours of cortisone therapy when only 70 mg had been administered. These improvements preceded any sign of skin softening by about 24 hours. Two and a half days after cortisone was started however there was definite improvement in skin consistency noted first in the arms and trunk. At this time feedings by nasogastric polyethylene tube were first given and retained consistently. The patient's weight which had dropped to 3 pounds 10 ounces began to increase slowly. In addition the pulmonary aeration improved and the peripheral and circumoral cyanosis disappeared. In 10 days the skin was considered normal.

The hospital course thereafter was uneventful except for the occurrence of two short-lived episodes of melena both of which seemed to respond to the administration of supplemental vitamin K. The infant was discharged on the thirty sixth day weighing 5 pounds 10 ounces. Physical examination at this time revealed no abnormalities. When last seen in the outpatient clinic he was nine and a half weeks old weighed 8 pounds 3½ ounces and was normal.

DISCUSSION

In June 1948 Hughes and Hammond reviewed the significant findings in 25 previously reported cases of sclerema neonatorum and added three of their own. Various therapeutic measures (no steroids) were used but 75 percent of the patients died. They considered that shock with insufficiency of the peripheral circulation might well be a precipitating factor in the cause of sclerema. They noted the frequent occurrence of concomitant infections and major congenital anomalies in the patients reported. The severe difficulties encountered by the three infants reported here prior to the onset of the characteristic skin changes would tend to bear out their theory. The chilling solidification sequence of the olein poor fat of infancy seems to be the most tenable explanation.

Previous methods of therapy have yielded uniformly poor results. The one exception to this is the possible value of thyroid extract, which has been employed effectively in several instances. The excellent results which have been achieved in all

of the patients reported in which corticosteroids have been employed, however make this the treatment of choice

SUMMARY

Cortisone appeared to be dramatically effective in the treatment of three infants with sclerema neonatorum

Early recognition of this entity which was previously fatal in most patients, has become an obligation to all physicians who care for newborn infants

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Claudius Amyand Surgeon

Medical history has given credit to Mestivier of France for the first surgical attack upon the appendix Claudius Amyand of London performed the first successful recorded appendectomy on December 6 1735 22 years before Mestivier's unsuccessful incision and drainage of an appendiceal abscess The life of Amyand is a collection of bits and pieces there is no complete extant record of the career of this surgical pathfinder He had a number of claims to fame none of which has been sufficient to preserve his name though he was Sergeant Surgeon to King George II pioneer in smallpox inoculation Fellow of Royal Society first principal surgeon to the Westminster Hospital a founder and first principal surgeon to St George's Hospital Master of the Barber Surgeons—one of the leading London surgeons of his day—and the first surgeon to do an appendectomy Claudius Amyand was not a man of genius but one of solid worth who merits a nod of recognition from medical history too long denied him

—PHILIP G. CREESE M.D.

in Surgery Gynecology and Obstetrics

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Hyperventilation can occur as a compensatory mechanism in metabolic acidosis (an increase in anions or a decrease in available base). The increase in anions may be due to chloride as in sodium chloride and ammonium chloride therapy phosphate sulfate or organic acids in renal insufficiency or in diabetic acidosis. Musser and associates noted that hyperventilation frequently produced symptoms in patients with diabetes which were often mistaken for hypoglycemic reactions. Rebreathing expired air or other measures used to neutralize alkalosis can only aggravate a pre-existing acidotic state. Patients with chronic pulmonary disease and emphysema are less apt to develop symptoms of hyperventilation.

Dizziness is usually the first symptom produced by hyperventilation and is an accompanying symptom of cerebral anoxia as seen in arteriosclerosis aortic stenosis and insufficiency and Adams Stokes syndrome. In hyperventilation the respiratory alkalosis significantly alters the release of oxygen from hemoglobin. With a lowered carbon dioxide pressure in the blood hemoglobin clings more tenaciously to its bound oxygen and less oxygen is released to the tissues. Tissue oxygenation is also hampered by the decrease in blood flow because of the contracted blood vessels in tissues with low carbon dioxide pressure.

The hyperventilation syndrome should be considered when dizziness weakness and headache are the presenting complaints. The use of voluntary forced respiration will often produce within one to three minutes symptoms that the patient will readily admit were those which caused him to seek medical advice. Normal persons also will show the same symptoms but some patients are thrown into a state of tetany because they are on the threshold of attacks periodically or constantly. A pre-existing alkalosis predisposes a person so that even mild hyperventilation can produce symptoms. Subconscious worry or fear can cause overbreathing. Most patients appreciate the physician's demonstration that the terrifying sensations are not imaginary. The forced breathing test will often prevent future attacks because it makes the cause of the symptoms obvious to the patient.

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Early Clinical Research in Scurvy

James Lind, a pioneer in clinical nutrition experimentation was born in 1716 and died 78 years later the respected head of the Royal Naval Hospital at Haslar. Although he deserves full honor for his recommendations on personal cleanliness hygiene and sanitation which really began the science of naval medicine and for his studies of tropical preventive medicine he is best known for his report of a simple experiment on board the H. M. S. *Salisbury* in 1747.

Lind selected 12 scorbutic sailors from the many on board. These men were as alike as possible in regard to symptoms and physical condition. He then tested simultaneously the various therapies in common use at that time. Six groups of two men each were formed. In addition to the usual rations one group received a quart of cider a day another 25 drops of an elixir of dilute sulfuric acid three times a day and a mouth wash of this preparation. Similarly other groups received vinegar sea water and a pill containing garlic radish mustard seed and the like. One group of two men had a lemon and two oranges daily.

Within a week these last two recovered to such an extent that one man returned to duty while the other acted as nurse for the other ten whose condition scarcely changed. This study was well planned and concise and even according to modern advanced ideas on scientific research, it was a well controlled experiment. Lind's clear statements of his careful observations leave no question as to the importance of the findings.

—S. O. WAIFE, M.D.

in *Journal of Clinical Medicine*

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Tubo Ovarian Abscess Complicating Intrauterine Pregnancy

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A REVIEW of the literature of tubo-ovarian infections complicating intrauterine pregnancy yielded scant information. McCall in a discussion of surgical complications of pregnancy concluded that salpingitis is seldom a problem. Metzger in 1939 made a 15 year review of French literature and found only seven references.

This communication in describing tubo-ovarian abscess in a patient with a pregnancy of 20 weeks gestation reports an infrequent complication which presents an unusual problem in diagnosis and management.

CASE REPORT

A 24 year old woman gravida 3 para 2 presented herself at the obstetrical clinic on , December 1952 and stated her last menstrual period began on 13 August 1952. The estimated date of confinement was 20 May 1953. She was completely asymptomatic except for the amenorrhea and a sensation of weight in the lower abdomen.

The onset of the patient's menses occurred at the age of 14 and the menses were usually regular. In 1947 the patient received a 10 day course of penicillin for syphilis. In December 1948 after a normal pregnancy she delivered her first child. Four weeks post partum she was hospitalized for pyelitis and peritonitis which responded well to antibiotics and supportive therapy. In 1950 she received penicillin for gonorrhea with apparently good results. In March 1952 again after an uneventful pregnancy she delivered a normal child but about six weeks post partum developed pyelitis and salpingitis requiring hospitalization. Treatment consisted of bed rest, antibiotics and supportive measures over a period of two weeks. When discharged on 12 May 1952 a pelvic examination revealed a slightly enlarged uterus displaced to the right with tenderness and thick

F m U S N I H p t i l N w p r t R I L G y n s k o w g d h D
p e r y P m h N v a l S h p y a d P m h N H

ening in the right adnexa. The coexisting inflammatory disease was treated on an outpatient basis.

Examination revealed a small, thin woman, who appeared in good health. Temperature, pulse, respirations, and blood pressure were within normal limits, and positive findings were limited to the pelvic examination. The vagina was free of discharge. The uterus was enlarged to the size of a 20 to 22 weeks' gestation and displaced to the left by a firm, tense, slightly tender mass measuring 6 to 8 cm. in diameter, which apparently filled the right pelvis and was adherent to the uterus and the right lateral pelvic wall.

Routine prenatal laboratory tests were negative. The white blood cell count was 10,150 with a normal differential. A roentgenogram of the abdomen showed early calcification of a fetal skeleton projected onto the left innominate bone. The uterus could not be outlined. There was no roentgenographic evidence of a pelvic mass, but the impression was that of ectopic pregnancy.

The provisional diagnosis was an intrauterine pregnancy of 20 weeks' duration, complicated by a right ovarian cyst. The patient was seen again 10 days later. Pelvic examination at that time revealed the mass to be 8 to 10 cm. in size. In view of the apparent progression of the lesion, the patient was hospitalized on 16 December 1952 and given 600,000 units of penicillin and 1 gram of streptomycin daily, in addition to supportive therapy and prophylactic antiabortal regimen, preparatory to surgery.

On 18 December 1952, a laparotomy was performed under spinal anesthesia supplemented by thiopental sodium (pentothal), nitrous oxide, and oxygen. The uterus was enlarged to about 20 weeks' gestation and displaced into the left lower abdominal quadrant. The greater portion of the true pelvis was filled with a fluctuant mass 8 cm. in diameter which was fixed posteriorly by numerous small bowel adhesions. The leaves of the right broad ligament formed its anterior border, and laterally the mass was adherent to the pelvic wall on the right and to the uterus on the left. The proximal one third of the right fallopian tube was identified; distally, it was incorporated into the mass. The right ovary could not be identified. The left tube and ovary showed no active inflammatory process. The mass was dissected free of the uterus, with sacrifice of the right tube. In so doing, the mass was inadvertently opened and a small amount of purulent material exuded into the operative field. The contents of the abscess were aspirated and a culture taken which subsequently produced a growth of bacteria reported by the pathologist as pneumococci.

Postoperatively 6 million units of penicillin 8 grams of streptomycin and 7½ grams of sulfadiazine were administered. In addition the patient received 20 mg of progesterone intramuscularly daily meperidine hydrochloride (demerol) for pain and phenobarbital for sedation. A Miller Abbott tube was used and intravenous fluids were given for the first three postoperative days. The patient was permitted out of bed after 12 hours. Her course was uneventful except for mild lower abdominal cramping which responded well to increased sedation. She was discharged on the tenth day.

The patient was seen in the prenatal clinic at regular intervals throughout the remainder of her pregnancy and was maintained on daily 60 mg doses of progesterone given orally. On 11 May 1953 she was readmitted in active labor and after three hours spontaneously delivered a living female infant. The immediate postpartum course was uneventful. The highest recorded postpartum temperature was 98.6 F and she was discharged on the fifth day. Pelvic examination at this time revealed a normally involuting uterus without adnexal tenderness or masses. Routine postpartum examination at six weeks revealed normal genital involution and after 12 weeks there was no evidence of pelvic disease. The condition of the infant was excellent.

DISCUSSION

This patient presented a significant history with two episodes of puerperal pelvic peritonitis which responded to treatment. During remissions the residual infection and anatomic scarring were insufficient to prevent pregnancy. Conception apparently occurred through the left tube suggesting that unilateral inflammatory involvement of the adnexa is possible and may not be conclusive as a differential diagnostic criterion of ectopic pregnancy.

Bacteriologic examination of the lesion in this case revealed pneumococci. Black¹ reported that ovarian abscesses were streptococcal in origin while tubo-ovarian infections were primarily gonorrheal. Metzger concluded that *Escherichia coli* and staphylococci and only rarely gonococci were responsible for these infections. In cases gathered from the literature where cultures were taken the organisms isolated were *E. coli* - staphylococci - streptococci - gonococci and pneumococci.

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Adiposity and Atherosclerosis

Until recently atherosclerosis was considered an inevitable consequence of ageing. Today our approach to its etiology is more hopeful and most would agree that the basic cause of this morbid process may well be a metabolic defect. What this defect is we cannot say but we may assume that it involves the biosynthesis, the transport, the catabolism or the excretion of certain lipids and perhaps especially of cholesterol in the form of lipoproteins. Many methods have been used to study the blood lipids. All show considerable deviations from the normal plasma lipid pattern which is especially marked in the younger victims of atherosclerosis. This is so whether they have a condition known to affect lipid metabolism like diabetes or whether they have an inborn error of metabolism which sees its most marked expression in cases of familial xanthomatosis. If it be agreed that severe atherosclerosis in young subjects is the result of a disorder of lipid metabolism we must then ask ourselves whether we may similarly ascribe atherosclerosis in the older population to what must be a most widespread disorder. If we do accept such a thesis we must presume the metabolic derangement generally speaking to be of a low order so that its effects become apparent as a rule rather late in life. If this is so we may expect to find factors which would have an accelerating influence on such a disorder. Adiposity has been accused of such a role.

—W. FORD CONNELL, M.D.

in Canadian Medical Association Journal
p. 248 Mar 1954

GEN OTIS BENSON AND OTHER OFFICERS ELECTED BY AERO MEDICAL ASSOCIATION

Brigadier General Otis O. Benson Jr. USAF (MC) Director of Staffing and Education Office of the Surgeon General U S Air Force was installed as president of the Aero Medical Association at the conclusion of the society's 25th anniversary meeting in Washington 29-31 March. Kenneth E. Dowd M.D. Montreal Canada was named president elect and the following were elected vice presidents: Jan H. Tillisch



N. J. Officer of Aero Medical Association and a delegate of the C-124 Club met for a convention of the U.S. Air Force. Major General E. A. Daley, Brig. Gen. Miguel Lafont, Brig. Gen. Otis O. Benson Jr. and Maj. Gen. M. D. Rochester.

M.D. Rochester, Major General Miguel Lafont, Surgeon General of the Spanish Air Force, Air Vice Marshal E. A. Daley, Director General of Medical Services, Royal Australian Air Force, Major Klaus Weisner, Chief Flight Surgeon, Swiss Air Force, and Seymour Fiske, M.D., New York, N.Y.

Naval and Air Force member elected this year to the grade of Fellow are Lt. Comdr. Edward L. Beckman (MC) USN, Comdr. Sidney I. Brady (MC) USN, Lt. Col. Vincent M. Dowey USAF (MC), Col. George B. Green USAF (MC), and Col. Kenneth L. Pletcher USAF (MC).

The 1955 meeting of the Association will be held in Washington.

Technic for Taking Band Impressions

EDMUND E. JEANSON, *Commande (DC) USA*

CURRENT design in bridge abutments, single crowns or other major rehabilitation abutments strongly emphasizes full surface coverage. The reason for this is obvious because greater strength and balance will result therefrom. At the same time prevention of decay of the restored tooth structure is assured.

This method of restoration has always presented two major problems to practitioners who use the seamless copper band impression method as the technic of choice: (1) accuracy, and (2) prevention of possible gingival tissue damage. The necessary equipment required for this technic is shown in figure 1.

PREPARATION OF BAND

Selection of a proper size copper band is most important, but may be simplified by using one of the handy type storage and gage chests on the commercial market. The size of the band can be determined by fitting it on the preparation, being careful not to press it beneath the gingival tissues. After this has been accomplished, the labial or buccal surface of the band should be marked with a hole or notch, or otherwise indicated to aid in contouring the band to conform with the preparation (fig. 2). The cervical contour of the preparation should be thoroughly observed and the deep or shallow dips of the buccal and lingual tissue noted.

Using the handpiece and a 5/8 inch heatless stone, the band may be cut to the desired shape. Shaping a band with a heatless stone slightly rounded on the cutting edges is easier than with a square-edged stone, as the latter usually produces a stepping effect. There seems to be less occasion of collapsing the band in cutting if the stone is turning from the inside of the band toward the outside. Because the contoured edge of the band is quite rough, this barbed edge is removed by again using the large heatless stone (figs. 3 and 4).

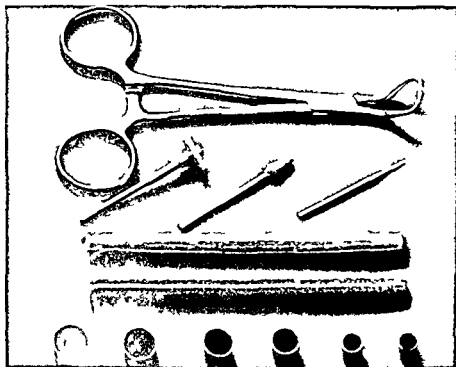
This smoothed edge (1 1/4 to 2 mm in height) is made into an indicator or gage line which can be used as a visual aid in noting how far the edge of the band has been inserted under

From L. S. N. 1, 1944, by A. E. 1, 1944.

the gingival tissue. The inside of the band is smoothed with a large conical stone. After all cutting on the band has been completed it is annealed by heating to a bright red over the bunsen burner and quenching in water. An annealed band is much softer and adapts more easily to the convexities of the tooth. This also prevents any spring created by the properties of the copper metal from distorting the completed impression.

FITTING OF BAND

The contoured band is placed over the tooth and correction in contour which should be made is noted and the fit of the band



Figu 1 Equipm t q d

is checked. It should fit snugly in its entirety. A band that is too large is certain to collect tissue into the impression as well as damage the tissues. If the band is too small it will never find its way into the final position and cover all parts of the preparation. When the final check for accuracy is made the band should always be positioned so that it is in line with the long axis of the tooth. Thus the band will always be inserted into the preparation in the same position and there will be less danger of fracturing any part of the impression when it is removed. The position of the gage line beneath the gingival tissue should be noted at this time.

In preparing crowns where full or partial shoulders have been cut—whether for better retention, veneer inserts, or clear finish lines—a more difficult problem is presented. If it is not inserted in the long axis of the tooth or in the position for which it was cut and tried, there is little hope of attaining an accurate impression.

In using stick compound as the impression material, vasoline on the fingers and on the bracket table or other working area will

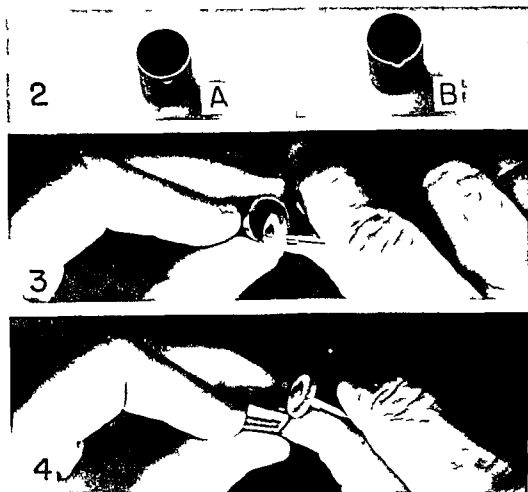


Figure 2 (A) Band marked with hole (B) Band marked with notch Figures 3 and 4 Removing band edge with stone

prevent any hot compound from sticking to the fingers, and will aid in the manipulation of the compound. If the compound is melted into the band, overheating or bubbling of the compound should be prevented. When the compound is placed in the band, the shape of the contoured band should not be disturbed in any way. Just prior to taking the impression, the tooth should be thoroughly washed of blood and saliva, and painted with a lubricant such as tincture of green soap. The loaded band is then placed over the

model an acrylic splint is made (fig 2) These splints are tight and maintain the desired anatomic position without interference with the circulation They can be bivalved like casts and unnecessary sections cut away to provide windows for dressings and for evaporation of perspiration



Fig 2

An acrylic cast or splint can be prepared in a short time at any medical installation with a dental laboratory service The objections of the time and effort required in constructing such a splint is compensated for by its convenience comfort, and efficiency during the six weeks of immobilization required in the proper management of this type of injury For those medical officers who lack the facilities required for acrylic cast work the splint recently described by Spigelman² would seem to be the most acceptable yet devised

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Neuroses in Older Patients

I am always reluctant to diagnose a neurosis in the case of a person past 55 who has never been neurotic before It is far more likely that the nervous symptoms that he has recently developed are on an organic basis

—WALTER C ALVAREZ M D
Genl p 668, D 1953

OFFICIAL DECORATIONS

LEGION OF MERIT

H bart D B lkn p Col MC USA
 Clyd L B th Brig Gen. MC, USA
 Edw rd G Byr Lt (jg) (MC) USNR
 Joh J Folk Lt Col MC, USA
 Ro ld N Gr t Comdr (MC) USN

Howard A Johns Comdr (MC) USN
 L P k rkp tr ck, Capt (MC) USN
 Do gl s L ds y Lt. Col MC, USA
 Ph lip J N l Jr Lt. Col MC USA
 Arthur Steer Lt Col MC, USA

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 Ma E A tt Maj MSC USA
 L w n E B k Lt Comdr (MC) USN
 By E B s ham Comdr (MC) USN
 William E B Lt (jg) (MC) USNR
 Richa d T Be ill 1st Lt MSC USA
 R cha d F B l g 1st Lt MC USA
 S r B nn fl Jr Capt. MC USA
 W ll m J Bra ll 1st Lt MC, USA
 W lt E B w Maj MSC, USA
 J h W Burk 1st Lt MSC, USA
 Jul us L Ca t g o 1st Lt MSC, USA
 L M C cil 1st Lt MC, USA
 J m E Ch pp Lt Col DC USA
 N th l M Cob Lt (MC) USN
 Ch t B Co Capt ANC USA
 Rob W D Lt (DC) USNR
 J h E D nl p J 1st Lt MSC, USA
 F d t k H Evan Capt MC USA
 Charl W F J Lt (jg) (DC) USNR
 Robert D F k Maj MSC USA
 S muel W F al Maj MC, USA
 A tho y J G gl n Maj MSC, USA
 Seymour M G to 1st Lt MC USA
 Fr d L G er 1st Lt MSC, USA
 Richa d A G y 1st Lt MC USA
 El no Harr gt Lt (MC) USN
 D gl H 1st Lt MC USA
 Edw B H ll d Lt. MSC USA
 Donald D H ll Lt (jg) (MC) USNR
 J h W Hunt 1st Lt MSC, USA
 S l y G W l h J Capt MC, USA
 M us M J quett Lt Col DC, USA

Che t L Ale Lt (jg) (MC) USN
 M l P k i 1st Lt MSC, USA
 Ch y F Levy J 1st Lt MC USA
 Edw F Luh Capt MC USA
 Robert W Lyk Lt (MC) USN
 Do ld A M 2d Lt MSC USA
 W llam E M y Lt (MC) USA
 W llam R M F ll 1st Lt MSC, USA
 N ma G M ller d Lt MSC USA
 B y B M nt Lt (jg) (MC) USNR
 L ern E N chol Ens (MSC) USN
 R hard J O Sh 1st Lt MC USA
 W ll m C. P tt r on, Capt. MC USA
 Sam l Pelz Capt. MC USA
 D n l M Pin Lt Comdr (MC) USN
 L l nd B P tt r Capt DC, USA
 W ll m G Pry Maj DC, USA
 L gh M R bert Lt (jg) (MC) USNR
 Carl F R m Maj MC USA
 Ma i E R yc 1st Lt MC, USA
 Az Ry 1st Lt MC USA
 D d H Sch ff y d Lt. MSC, USA
 Elm t J Sch w Jr Lt (jg) (MC) USNR
 B lly M Schl g lm lch d Lt. MSC, USA
 J eph B Sc tt J 1st Lt. MSC, USA
 Cyr l E She Jr Lt (jg) (MC) USNR
 F k J Sk beck Capt MC, USA
 Cha l B Sm th Capt. MC, USA
 H ra e D Sta to 1st Lt MC USA
 D C. Stea s 1st Lt. MSC, USA
 J F Thr h 1st Lt MSC, USA
 Joh V Tillm J 1st Lt. MSC, USA

First Oak Leaf Cluster

I th d partment ch m th th an of off cer of th medical serv c s who h
 b en ward d d cor t ons by th U ted St t s Army N vy or Ai F ce s nce the be-
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 fl l urc s—Editor

COMMENDATION RIBBON

Robert G All y May MSC USA
 Arthur C. A d 2d Lt. MSC USA
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 D d C B CHOHC USN
 E g W B hamp J 1 Lt Lt. AG, USA
 Al V Bl un J Capt MC USA
 Sta l y D B k Lt (Jg) (DC) USNR
 R b d A B det k Lt (Jg) (MC) USNR
 Ha nibal L B wnt w Capt MC, USA
 Chaon y D B Lt (Jg) (MC) USNR
 Da d M B l Lt (MC) USN
 W liam E Car ll J Capt. DC, USA
 W liam O Ca Lt. (MC) USN
 W E Co hran, 1 Lt Lt. MC, USA
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 Thoma A Co ll Capt MSC, USA
 J h F Cur Lt (Jg) (MC) USNR
 Phil Da 1 Lt Lt. MC USA
 P ul R G D P WOHC USN
 Arbur J Donova Lt (Jg) (MC) USN
 J na ha J E khart 2d Lt. MSC USA
 F nkl R F l y M, MC, USA
 W lbur C F 1 Lt Lt. MC, USA
 R be A G wdy Lt (Jg) (MC) USNR
 L w T Gr b m Lt (MC) USNR
 L l C Hah J 1 Lt Lt. MSC USA
 Clar A Harvey Lt (MC) USNR
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 J h W How d Lt (MC) USN
 Ma hall N J Col MC USA
 R ber L J h so 1 Lt Lt. MSC, USA
 S muel A J h so 1 Lt Lt. MC, USA
 L nzo D Jus Capt MSC USA
 J m M K nedy Capt MC USA
 W liam T K naha J Capt. MC USA
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 Th ma D L oc Lt (MC) USN
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 G g W L 1st Lt C USA
 Phil p M L gh foo Lt (MC) USNR
 R ber A Loeffl Lt (MC) USN
 R b D Lo d J 1 Lt Lt. DC USA
 Ca lse C. L g J 2d Lt MSC USA
 W ll m L Lonsdal 1 Lt Lt. MSC USA
 W yn M Lott Lt (Jg) (DC) USNR
 C R MacCo dy Lt (Jg) (MC) USN
 Buc R McCampb ll Comdr (MC) USN
 R b A. McG w n, Lt (Jg) (MC) USNR
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 Raymond C. Mill Lt (Jg) (MC) USNR
 Geo g W M ri J Lt (MC) USN
 R ber H Mo et Capt MC USA
 W ll P Murd b 1st Lt. MSC, USA
 Sh ma C. Myer Lt (Jg) (MC) USNR
 P ul A N ll 1st Lt. AG USA
 Ralph F Nuzum 1 Lt Lt. MC USA
 Donald C. O ry Lt (Jg) (MC) USNR
 L na d N P c 1 Lt Lt. MC USA
 J m M P ynt Lt (Jg) (MC) USN
 H ary K R m m Lt (MC) USNR
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 B h m D Rb d Lt (DC) USNR
 Ch l W R h 1 Lt Lt. MSC, USA
 Cha l L R k d Comdr (MC) USN
 J me M Rob Capt. MC, USA
 Cl ff d C. Roo Lt (MC) USN
 Eug ne I S Capt. USAF (MC)
 Eld O Schnoebel Lt (DC) USN
 Ch l J Sch k Comdr (DC) USN
 H ld G Schult May USAF (MC)
 Cla L S f Capt MSC, USA
 Charl G S lberman, 1st Lt. USAF (MC)
 Mal lm F Sl yt Capt. USAF (MC)
 Arthur F Sm h, 1st Lt. MSC, USA
 Cha l L Sm h J 1st Lt. USAF (MC)
 Edw W Sm h Capt. MC USA
 R b rt L Sm h Lt (Jg) (MC) USN
 F nc G Soul J Comd (MC) USN
 P J Sta h 2d Lt. MSC, USA
 Leo B Stoll 1 Lt Lt. MC USA
 R be M Surt May USAF (MC)
 L na d H S ppl 1 Lt Lt. MSC USA
 R B Taltaf J Lt (MC) USN
 W ll m A T p Lt (Jg) (MC) USNR
 Stanl y W Thomp n, 1 Lt Lt. MSC USA
 T d Tbbe Capt USAF (MC)
 Lyl E Tuck 1st Lt. USAF (V)
 J me R V nd hoof Capt. ISC USA
 R b F V Dyk Capt. DC USA
 R ber H V S y 1st Lt. MC USA
 R ld E V key Lt (MC) USN
 R ber E W d 2d Lt. MSC USA
 Ge g D W be g 2d Lt. MSC USA
 R bert Q W Capt MSC USA
 J eph M W Comdr (MC) USN
 Arthur E W Lt Comdr (V) USNR
 J m T W Lt (Jg) (MC) USNR
 W ll m R W Lt (Jg) (MC) USNR
 J m E W d Capt. USAF (MC)
 G ld G W druff J 1st Lt. MC USA
 Cl ff d L Y ma Capt. MSC USA
 H ry Z bk ll Lt Col USAF (MC)

REGULAR MEDICAL CORPS OFFICERS CERTIFIED BY SPECIALTY BOARDS

The American Board of Urology

Activated in 1935 to certify qualified physicians the American Board of Urology on 30 June 1953 had accorded this recognition to 1 809 practitioners of this specialty of whom, according to the Surgeons General of the U S Army Navy and Air Force, 28 are regular Medical Corps officers of the three services These officers are

Alton C Abnethy <i>Capt USN</i>	Avery P Kug <i>Lt Col USA</i>
R Town d Arma <i>Col USA</i>	Erl C Lowy <i>Col USA</i>
R P Black <i>Comdr USN</i>	Frack W Lynn <i>Lt Col USA</i>
J h P Brady <i>Capt USN</i>	L A Mc ell <i>Col USA</i>
Raymond R Callway <i>Capt USA</i>	Leahat L M t t <i>Lt Col USAF</i>
Joh T Cagls <i>Comdr USN</i>	Sid y Mill <i>Lt Col USA</i>
Ha ld J Cokely <i>Capt USN</i>	Lyl A N wto <i>Capt USN</i>
Ma k S Curt <i>Comdr USN</i>	Joh F P tt <i>Col USA</i>
Cl de C. Dod <i>Col USA</i>	R b t C Rus h t <i>Lt Col USA</i>
R ymo d J G t <i>Lt Col USA</i>	J h W R e <i>Capt USN</i>
J h S H t <i>Comdr USN</i>	R bert B R w <i>Lt Col USA</i>
J m J Hay <i>Capt USN</i>	J h A S hindl t <i>Col USAF</i>
Charl W H Hra J <i>Lt Col USA</i>	J ck W Schwart <i>Col USA</i>
P t E H th <i>Capt USN</i>	
Spe t J h <i>Capt USN</i>	

The following names of officers certified by the American Board of Urology are published for information.

Anesthesia in Cardiac Disease

No longer should cardiac disease be regarded as a contraindication to essential operations. But if general anaesthesia is required—and it can have some advantages for the patient in terms of reduced metabolism and increased oxygenation—it should be approached as a major undertaking even if the operation itself is brief and trivial.

From an editorial in *Lancet* p 549 Sept 12 1953

DEATHS

- ALLISON Betty J Se d L ut t USAFR (AFNC) U S A F
H sp t l S mp A F B N Y g duat d 1952 f m th
C l mb H p t l S h l f Nur g Col mb S C d d t t
d ty 22 F bru y 1953 d d 19 M h 1954 g 25 f jur d
an ut m b l d t S mp A F B
- BRADLEY k h l e Ann E g (NC) USNR U S N l H p t l M mph
T nn g d d 1951 f m M h t G l H p t l Sch l f
Nur g d d t t d ty 17 O t be 1952 d d 14 M h 1954
M mph g 23 f ut h mat f
- BUSENBARK Al J h n S d L t t MSC USAR Comp y
B M d l T g B ttal M d l R pl m t T g C t
Camp P k t t V d m l t a y 27 A g t 1940 mm d
d l ut 2 D embe 1952 d d 20 F b ua y 1954 Om h
N b ag 31 f phyxiat by bo m d
- DORMAN El T na L t t (NC) USN U S N l H p l St
Alb ns N Y gr dua d 1938 f m th St F S h l f Nur g
H t f d Co t d th l 3 N mbe 1942 d ed 21
Mar h 1954 S Alb ns g 36 f m l g t pl m
- FROST H h l Cl ff d M j MSC USA W l R d Army H p t l
W h g D C d d D ury C ll g Sp gf ld Mo t d mil y
22 J ly 1930 mm d d l na t 17 July 1942
d d 15 J ary 1954 t W h gt g 46 f my dial f t
or narv lus d t l t heart d
- HALEY W l l m M j MSC USAR H dqu & H d q t Comp y
15 h M d l B ttal F E t Comm d d h m l t a y
9 A g t 1938 mm d d l t na t 2 O b 1942 d d l
F bru ary 1954 g 33 ur f d t J p
- ROGERS H y H m l t F L ut t USAF (MC) U S A F
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b l U y S ho l f M d d d t t d y l J ly 1952
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D C f myo d l f
- TEICHER R lph C p USAFR (MC) U S A ir F H p l M w ll
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ne d d t t d ty 8 N mbe 1952 d d 28 F b ua y 1954 g
28 f jur d m b l d Gra d B y Al
- VIGUE Id R l ne L g d (NC) USNR U S N l H
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Nur g M h N H d th l N mb 1951
d d d ty 10 J ua y 1952 d d 7 M h 1954 P m h
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A MESSAGE FROM THE A M A

In the March issue a brief outline of the principal provisions of the "doctor draft law," of interest to physicians on active duty was presented in this column. To round out this picture, it is believed that a note on certain of the regulations issued by the Department of Defense under that law may likewise be of interest.

The implementing regulations which were published on 7 October 1953 (Number 1205 1) consolidated, reissued, and modified various earlier Department of Defense directives promulgated pursuant to Public Law 779 81st Congress as amended. Certain provisions of the regulations which established new policy or substantially amended previous regulations will be noted briefly.

The new regulations designate the Department of the Army as the "executive agent" for the Department of Defense and charge it with administrative responsibilities in connection with determining the acceptability of special registrants, maintaining liaison with Selective Service headquarters, and making departmental allocations of special registrants. The regulations contain detailed provisions on professional physical and moral standards prerequisite to acceptability and in addition outline the requirements with regard to the circumstances under which special registrants may be commissioned.

Determination of Commissioned Grade of Physicians and Dentists

<i>Years of experience</i>	<i>Army and Air Force</i>	<i>Navy</i>
Less than 4	First Lieutenant	Lieutenant (jg)
4 more but less than 11	Captain	Lieutenant
11 or more but less than 18	Major	Lieutenant Commander
18 or more	Lieutenant Colonel	Commander

*The grade of colonel is qualified to be given with 25 years or more of professional experience who has completed a thesis in their specialty.

An amendment to the regulations issued on 10 November 1953 provides that the rank assigned to those commissioned will be based on the number of years spent in appropriate professional activities following graduation and prior to date of entry on active duty as outlined above.

The new regulations contain provisions relative to readjustment of grades for those now on active duty or in a reserve component. Any physician appointed in a reserve component or now

From the Council of the American Medical Association. The new and proposed regulations of the American Medical Association of the Department of Defense.—Editor

serving on active duty who would have been entitled to a higher grade if Public Law 84-83d Congress had been in effect at the time of his entrance on active duty will be entitled to an adjustment of grade

The regulations further provide that a reservist will immediately prior to being ordered to active duty be reappointed or promoted to such higher grade to which he may be entitled and that a special registrant on active duty will at the earliest practicable date be reappointed or promoted to such higher grade

Finally it is provided that appointments to grades higher than major or lieutenant commander can be made without referral of the case to a board of officers convened by the secretary of the service concerned

Ordering commissioned personnel to active duty With regard to ordering commissioned personnel to active duty the regulations provide

1 Reserve medical personnel will *insofar as practicable* be ordered to duty in accordance with the priorities established in the doctor draft law

2 Members assigned to organized reserve units will be called to active duty as individuals in accordance with their priority except when their units are brought into active duty

3 Physicians who are members of a National Guard unit will not be called to active duty at this time (unless the unit is called) providing they were members of such a unit prior to June 25 1950

4 The essentiality of medical reservists will be determined by the National Advisory Committee to the Selective Service System Requests for delay on this basis may be made by a physician or an employer directly to the branch of the Armed Forces involved An appeal may be submitted directly to the Secretary of Defense in the event of a request for such a delay is disapproved

5 Any physician qualified for a reserve commission is given an opportunity to volunteer for a period of active duty of *not less than 24 months*

Interservice transfers According to the regulations physicians holding reserve commissions in the armed services may apply for transfer to another service An application containing specific identifying information must be submitted through command channels and must bear the endorsement of the parent and requested departments irrespective of their approval or disapproval in each case

PUBLICATIONS BY OFFICERS OF THE MEDICAL SERVICES

Abrams W B First Lt MC AUS and Chesley G L Capt MC AUS Billstoncardogr m: ac te rheumat c f v r *Circulation* 9 400-407 M r 1954

Barr N L Comd (MC) USN Radio t m s s i n of phys l g c i info mat *Mil Surgeon* 114 79-83 Feb. 1954

Bckma E L Lt Comdr (MC) USN Duan T D Lt (MC) USNR Z gl r J E Lt (MC) USN d Hunt H N S m ob tions on hum tol r ce to acc l t e ste pha IV huma tol r e to high positi G ppl ed t rat f 5 to 10 G pe s ond *J Aviat n Med* 25 50 66 Feb 1954

Bill A L L Jr First Lt USAF (MC) and Wood J E C pt USAF (MC) N w de c for me suring th flect of c nt p sit e pressure br thi g on lung l um s d v til t on *J Aviat on M d* 25 67 74 88 F b 1954

Beast in I C pt USAF (DC) and Small M Capt USAF (MC) For ig body n ck *J Am Dent A* 48 312 Mar 1954

B nst a M L Lt (MC) USNR Ca diac r e t occurri g und t chlo o thyle e lge ia report f c with r c y *A. M. A. Arch Surg* 68 262 266 F b 1954

Bowes W F Col MC USA and Sch E W M J USAF (MC) Ingu nal h rnia problem ew d f om t dpo nt f c rrent cases *Mil Surgeon* 114 163-172 Mar 1954

Bowm n M S Lt (MC) USN F m l l occurrence of idiopathic l f c t on f e bral ap l l s *Am. J Path* 30 87 97 J n Feb 1954

B d l y J L Comd (DC) USN d H l d th E R Lt Comd (DC) USN Inu oal p nreduct o of fra tur of ma d bl *Oral Surg* 7 225 231 M r 1954

B ggs G W Capt MC USA Sifr R A Frst Lt MC USA d O holt E L Maj MC USA, Pn uma y t d s testi alis rep rt of case *Ann. Int Med* 40 618-626 Ma 1954

B l J Col USAF (MSC) R c nt cont ibut ons f m d c l orps t m l itary m d i *Mil Surgeon* 114 113 117 Feb 1954

Bur h R J Col USAF (DC) R d ul yst w th ma lla y s i us *J Oral Surg* 12 72 73 J 1954

Dun J J First Lt MC AUS S l l W Capt MC AUS and Fr kl R. B C pt MC USA W lff Park n-White y d me sociated w th p o y mal ve tr cul s t hy dia *Am. Heart J* 47 462 469 M 1954

Fir J R M J MC USA U t m l t y problem *A. M. A. Arch Ophth* 51 364 368 Ma 1954

Fus l l M H R r g R N Lt Col MSC USA M t g r J R Capt MC USA and Enst A. F C l MC USA Ph g typ ng tibiot resi ta t t phyl i *Am. J Pub H alth* 44 317 322 M r 1954

G J T Comd (MC) USN Surgical tr atm t of pl nt wart c l l s t a d ulc s *Plast & Reconstruct Surg* 13 130-136 F b. 1954

Gur d K F S nd Lt MSC USAR nd Murr y E G D Influe c f sust d mo y t s up t body po b b ts to ous a t g ns *Canad. J Biochem. & Physiol* 32 1 13 J 1954

MEDICAL HISTORY OF THE SECOND WORLD WAR SURGERY d t d by S
V Z b ry Cope M D 772 pag II trated H M j ty S t y
Off L d p bl h 1953 P 80 t

War surgery is traumatic surgery applied under conditions of war and those conditions cannot be dictated by the surgeon or even by the high command. Thus does the editor of the second volume in the British World War II medical history approach the problem of surgery in combat.

In World War II there was steady improvement in surgery which was the sum of many influences including the fitness of the modern soldier, the short time between wounding and surgical treatment and the free use of whole blood. Important too were the developments in the realm of accessory methods—anesthesia, resuscitation, shock treatment and the use of antibiotics. The British record of that progress is unfolded in the present volume, provides a monument to surgeons who in war were brought back to a study of the basis of their craft, the reaction of the human body to injury and infection.

Individual chapters dealing with the highly specialized aspects of surgery skillfully analyze and synthesize the pattern of surgery as it modified and was modified by the evolving technique of warfare. In the period forces were mechanized, new weapons developed. Mechanization as it affected surgery meant that troops were fitter when they went into battle, that fewer men were wounded and that casualties reached the surgeon earlier. Chief weapons were high explosive shells, aerial bombs, mortars, land mines and rockets, cutting weapons virtually disappeared. Common wounds were multiple lacerations and generally retained foreign bodies. In addition, casualties frequently suffered crushing by falling masonry and overturned vehicles and burns were sustained in tanks and planes and through calessness.

These changes in the techniques of warfare together with other advances were to bring a corollary change in the surgery of wounds which passed through three phases. The first was the use of closed plaster after the method of Orr and Trueta. In the second wounds were debrided and drained, the limb immobilized for transport in a padded plaster or some form of plaster box splint with closure by secondary suture or skin graft as soon as the surface was covered with healthy granulation. Third, the wound was debrided at forward units and closed by delayed primary suture at the base between the fourth and sixth day. These phases prompted by development of chemotherapy also represented an evolution to meet the changing circumstance of war. Each method was right for a certain time and place.

It seems unlikely that any military surgeon would willingly omit the official British military medical history from his basic library. Certainly no medical historian or medical library should be without both the volume and the previously published *Medicine and Pathology* a

well as the projected units in the series scheduled to cover the Royal Navy Army and Royal Air Force and Civilian Services. The British have set a high standard in their contributions to an increasingly significant field in medical history — *MAE M. LINA, Ph D*

EXISTENTIAL PSYCHOANALYSIS by *Jean Paul Sartre* Translated and with an introduction by *Hazel E. Barnes* 275 pages Philosophical Library New York N Y 1953 Price \$4.75

This book is a translation of selected portions of Jean Paul Sartre's *Being and Nothingness* (*L'être et le néant*) but is difficult to read because of the modes of expression. Some of the ideas presented once understood are fairly simple and sometimes logical. On the whole however one tends to become lost in a wilderness of arguments and problems. On the practical side the book contains a fairly concise comparison of empirical and existential psychoanalysis although some of the differences are more semantic than fundamental. Sartre for example rejects the concept of the unconscious but substitutes for it a concept of consciousness without knowledge. The discussion on bad faith in the latter portions in which falsehood and self-deception are investigated is interesting. Sartre seems to believe that some of the conventional concepts such as of ego and id are too concrete and tend to deny psychic unity. It may be however that this criticism indicates failure or inability to understand the value of symbols in communication. The fact that the translator devotes 37 pages to explanatory introduction best indicates the difficulties the reader can expect to encounter — *WILLIAM H. ANDERSON, Lt Col, MC USA*

THE CUTANEOUS MANIFESTATIONS OF SYSTEMIC DISEASES by *John Godwin Downing, M.D.* 146 pages illustrated Charles C. Thomas Publ. Springfield Ill 1954 Price \$4.25

This monograph is a compilation of lectures given to the medical students at Tufts College Medical School and Boston University School of Medicine. Although larger and more comprehensive texts on the subject are available most of the systemic diseases possessing distinctive cutaneous manifestations are covered in a brief and concise manner.

The book has chapters devoted to disorders of nutrition, blood, allergy, heredity, the endocrine glands, mycosis fungoides and related diseases, the rheumatic diseases, systemic infections, and the scleroses. There is also a chapter on the color of the skin and mucous membranes and one devoted mainly to sarcoidosis and lupus erythematosus.

Some rare syndromes and diseases however are described so briefly as to tend to confuse the nondermatologist. There is no discussion of histopathology or treatment. The monograph is up to date, printed on excellent paper, attractively bound, well illustrated, and has an adequate index and bibliography. It is recommended to medical students and general practitioners — *KARL V. KAESB, Comdr (MC) USN*

PROBLEMS IN THE ANATOMY OF THE PELVIS Ad by Ed d Ubl
 b th Ph D w h th t f D W tt T H t M D 206 p g
 82 ll tr t by W ll m E L ch l J B L pp c tt C Ph l d l
 plu P p bli h 1953 P ic \$10

Text and atlas are h ppily combined in this single volume designed for the guidance of advanced students of the detailed anatomy of the pelvis The structures emphasized are those of particular surgical interest

The text proper to which a third of the book is devoted discusses the surgical anatomy and relationships of the retrovesical space in the male the musculature of the bladder and the muscles of the pelvic diaphragm and rectum The section on the vesical trigone and urinary sphincters is exceptionally well done Sixteen figures illustrate the concise text and the adequate historical notes are related to 53 references

Two third of the book consists of a series of 64 original dissection plates each with a page or two of easily understood explanation and legends The series provide a unique and much needed aid for correlating gross structure seen in the dissecting room with the histologic picture of the structures revealed

This atlas text should be of interest to surgeon and to advanced students who desire to perfect their knowledge of the anatomy of the pelvis by actual dissection — BENNETT F AVERY Capt (MC) USN

CYBERNETICS Circ l Ca l d F db k M cha m i B l g l
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Of primary interest to a limited audience of students of the biologic and social aspects of cybernetics this book represents a verbatim report of discussions during the symposium in New York City in March 1952 Rambling and at times disjointed it parades the thought processes of unquestioned experts rather nakedly as they seek logical solutions to problems which in the present state of this infant discipline lend themselves for the most part only to abstract treatment A gamut of subjects are included among which are humor in communications the place of emotions in the feedback concept and cybernetical aspects of homeostasis Probably the most interesting aspect of the book is the intentional crossing of disciplines of various phases of engineering with psychology neurology physiology psychiatry and other branches of science within the framework of the concept of control through feedback The reader finds it difficult to rid himself of the feeling that content was limited more by the clock rather than by completion of phases of the discussion and finally that he has been left high in a cloud without visible means of return to earth

—PAUL A. CAMPBELL C I USAF (MC)

CHRONIC ILIAC PAIN IN WOMEN by *H B Atlee* M D 65 pages illustrated
Charles C Thomas Publisher Springfield Ill 1954 Price \$2 50

This book is another excellent volume in the series of monographs of American Lectures in Gynecology and Obstetrics. It presents an important subject which is a frequent complaint of a high percentage of women many of whom are operated on without being helped.

The author has a charming pleasant and lucid style. He stresses nonspecialist psychiatry and the importance of knowing each patient as a person. His approach to the subject and his philosophy revives the feeling that the practice of medicine is still an art.

This is a useful book for every doctor's library.

—SAUL L. AVNER Lt Col MC USA

PHYSIOLOGY by *Rolland J Main* Ph D revised by *Alfred W Richardson*
Ph D 2d edition 474 pages illustrated The C V Mosby Co St
Louis Mo 1953 Price \$7

This remarkably concise but comprehensive summary of primarily human physiology is now after seven years brought out in a greatly improved form. The book still deals with the abstracted fundamental concepts of advanced physiology but is reorganized into body systems—basic metabolic fluid and integrative—plus homeostatic mechanisms.

There are important new chapters on renal physiology, metabolism and the autonomic nervous system. In addition recent advances are reported in endocrinology, the dynamics of body fluids, the role of the hypothalamus and respiration to name only a few. Modernized concepts have been incorporated into every chapter.

For those not familiar with this text it is a fairly complete summary useful for review and for bringing one's knowledge of physiology up to date. The subjects stressed are those that are of clinical importance, involve recently discovered information or are complex and often poorly understood. Human rather than comparative physiology is accented and no historical material, experimental details or references are included.

Some of the illustrations of which 26 are new in this revision are ingeniously designed to clarify difficult concepts; others such as the simple unlabeled view of the heart (fig 24) appear superfluous in an advanced text of this type. The format is pleasing with clear type and a volume of handy size for easy reading. A most useful feature is the unusually extensive index.

This second edition should prove even more valuable than the first to upper-class medical students and physicians in learning what is new in physiology and relearning what has been forgotten.

—BEAUNETT F AVERY Capt (MC) USN

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CLINICAL ORTHOPTIC PROCEDURE A Reference Book on Clinical Methods of Orthoptics by *William Smith O D* Associate Instructor in Optometry and Instructor of Orthoptics and Visual Training Massachusetts College of Optometry Boston Mass 2d edition 524 pages 91 illustrations The C V Mo by Co St Louis Mo 1954 Price \$10

FEELINGS AND EMOTIONS by *Laurence K. Frank* Formerly Director Caroline Zachry Institute of Human Development Doubleday Papers in Psychology DPP 3 Consulting Editor *Eugene L. Hartley* Professor of Psychology The City College New York N Y 38 pages Doubleday & Co Inc Garden City N Y 1954 Price \$0 85

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Heming A, Young M Y, Suchet J and Rowe A J E. Penicillin content of blood serum after various doses of penicillin by various routes. *Lancet* 2: 621-624 Nov. 11, 1944.

Calot R C. Pernicious and secondary anemia, chlorosis and leukemia. In Oser W (editor). *Modern Medicine*. 3d edition. Lea & Febiger Philadelphia, Pa. 1927. Vol. 5 pp. 33-100.

FIGURES AND TABLES

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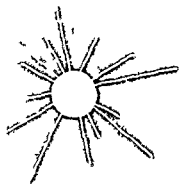
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The Department of Defense has authorized the Army Navy and Air Force to grant retirement point credits to eligible Reserve Officers of the military medical services for attendance at this meeting

TABLE 2 *False aneurysms*

patient	Duration of aneurysm (months)	Artery involved	Operation	Result	Remarks
1	2	First portion of subclavian	Ligation	Fair	Brachial plexus injury—limited duty
2	1	Axillary	End-to-end anastomosis	Good	Severe brachial plexus injury—retired
3	1	Axillary	Autogenous vein graft	Poor	Arterial insufficiency on exertion—retired
4	23 days	Axillary	End-to-end anastomosis	Fair	Severe brachial plexus injury—retired
5	5	Axillary	End-to-end anastomosis	Good	Brachial plexus injury—limited duty
6	2	Axillary	End-to-end anastomosis	Good	Severe brachial plexus injury—retired
7	6	Brachial	Transverse repair	Good	Right amputation below knee—retired

TABLE 2 Fl a r y m --C t t d

P t t	Dur t f ry m (mo th)	Art ry l d	Op t	R ult	R m k
8	1	B h l	L g t	G d	M d r y l m d d ty
9	2	B h l	E d o d tom	Go d	D ty
10	1	Bra h l	E d o d tomo	Good	M d r y l m t d d ty
11	1	Rad l	E d to- d na t mo	G d	R ight am p t t t k till h p tal d
12	3	R d l	End t d t m	G d	Sep ra n d t hand jury
13	2	S p f l l l h	L gat	Go d	Se b h l pl t j ry u d
14	17 d y	Commo f m ral	Tra p	G d	Em g y p t y l m d d ty

TABLE 2 *False aneurysms*—Continued

Patient	Duration of aneurysm (months)	Artery involved	Operation	Result	Remarks
15	1	Iliopsoas	End-to-end anastomosis	Good	Duty
16	15	Popliteal	Transverse repair	Good	Partial loss of foot from gun hot wound
17	3	Posterior tibial	Ligation	Good	Foot drop traumatic arthritis recurred
18	3	Anterior tibial	Ligation	Good	Fractured tibia limited duty

superficial femoral vein graft was used to bridge a 6.5 cm defect in the brachial artery

Three of these patients returned to full duty and six to limited duty. Seven were retired because of concomitant injuries and one was still in the hospital at the time of writing. Two patients in whom end-to-end anastomosis of the brachial artery was done also had severe injuries to the brachial plexus and it is difficult

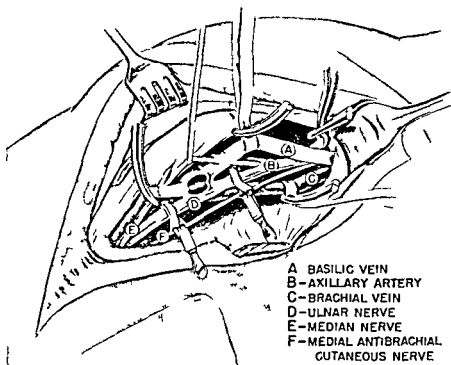


Fig 1 (c) 6) Dissection of the brachial artery and basilic vein at surgery

to evaluate the functional result of the operation from the standpoint of vascular insufficiency. These patients have warm hands which occasionally become cold and slightly blue. One patient in whom an autogenous vein graft was used developed a thrombosis and after a trial of duty was retired because of moderate arterial insufficiency in his hand.

During the early part of World War II the majority of arteriovenous fistulas were treated by quadruple ligation and the aneurysms by aneurysmorrhaphy preceded or followed by sympathectomy if an extremity was involved. For example, arterial continuity was restored in 27 percent of the first 150 patients treated by Shumacker and Carter, whereas this was accomplished

in 52.7 percent of a later group of 55 patients Freeman³ at the same time, found that in 23 cases in which major vessels of the lower extremity were involved a large proportion of those ligated had vascular insufficiency, whereas only a small number with restoration of the vessel had insufficiency. This has been a rather constant finding (table 3).

A number of important points in the operative management of these patients should be kept in mind. The incision should al



Figure 2 (case 6) Arteriogram demonstrating fistula between brachial artery and basilic vein.

ways be adequate and, in order to avoid the formation of contractures, should never cross flexion creases. Proximal and distal control of the main arteries should be obtained prior to entering the aneurysm or fistula. In some cases a tourniquet may occasionally be used in the distal extremities if the collateral circulation is good. Every attempt should be made to preserve collateral vessels. A sterile stethoscope should always be available to aid in the localization of the fistula and to rule out the presence of multiple arteriovenous fistulas. A heparin sodium saline solution is used to irrigate the artery periodically to prevent thrombi from forming and to keep it moist. The type of suture used is an everting continuous mattress stitch reinforced by a continuous over and over stitch. Usually three or four such sutures. No. 00000 silk are needed for an end-to-end anastomosis. The peripheral nerves must be carefully protected and, if previously damaged, neurolysis or neurorrhaphy carried out.

TABLE 3 Leg t i t i f a t i o n

Ath	M i l i t	L g t	P t p t e u f f c y	R t t	P p t e u f f c y
S e l y d c i t	93	27	8	66	4
G b o d c t	24	13	7	11	2
H g m d t	44	36	13	8	0
F e e m a n	23	12	9	11	2
W d t (p r e t a r t l)	17	2	1	15	2

CASE REPORTS

Case 6 This patient had been wounded in Korea on 20 September 1951 by multiple mortar fragments which entered both arms, the left side of the neck, and the chest. In October 1951, he



Figure 3 (case 17) Preoperative arteriogram showing aneurysm of popliteal artery and fistula between posterior tibial artery and vein.

noted a buzzing sensation in his right upper arm associated with shocklike sensations shooting down into his hand. He had a continual murmur and palpable thrill over the medial aspect of

the upper right arm just distal to the axillary fold without any evidence of paralysis. The right radial pulse was of good quality. Five months after injury the axilla and arm were surgically explored (fig 1). An arteriogram was performed under direct vision

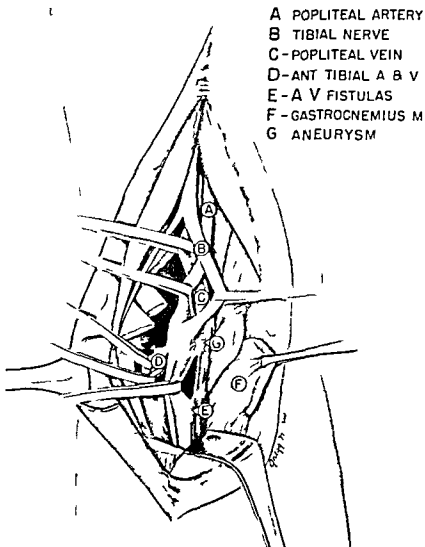


Fig 4 (17) Drawing of fistula between popliteal artery and vein and aneurysm of popliteal artery.

which showed the fistula between the brachial artery and the basilic vein (fig 2). The artery was repaired by transverse suture and the vein was ligated. Postoperatively the radial pulse was of good quality but the patient noted intermittent edema of his right arm. After a trial of duty he was retired from the service.

This case demonstrates that wherever possible it is advisable to repair the vein also

Case 17 This patient had been wounded in Korea on 21 November 1952 by grenade fragments which caused multiple penetrating



Figure 5 (case 17) Postoperative arteriogram showing site of repair of popliteal artery and absence of posterior tibial artery

wounds of the lower extremities. These resulted in amputation of the fourth and fifth toes of the right foot. He was returned to limited duty in April 1952 although he still had swelling and

aching of the left calf. The swelling did not diminish with elevation or bed rest. Diagnoses of thrombophlebitis and varicose veins were considered until an alert physician made a stethoscopic examination of the left calf and discovered a continual murmur. He was transferred to this hospital where arteriography revealed an aneurysmal out-pouching of the left popliteal artery and an arteriovenous communication between the posterior tibial artery and vein (fig 3). In December 1952 the popliteal artery was repaired by transverse suture and the arteriovenous fistula treated by quadruple ligation (fig 4). Postoperatively the dorsalis pedis pulse remained strong and no evidence of arterial insufficiency developed. Postoperative arteriograms showed a patent popliteal artery (fig 5).

This case reveals the necessity for auscultation in all extremities which have sustained penetrating wounds. Failure to listen with a stethoscope to this patient's calf resulted in long delay in the proper treatment of his arterial injuries. Arteriography was of value in showing the presence of lesions of both the popliteal and posterior tibial arteries. Ligation of the lesser vessels of the lower leg in young adults can be performed without risk to the circulation of the extremity.

SUMMARY

In 31 patients treated for arterial injuries from combat wounds 15 of 17 major vessels have been repaired with resultant vascular disability in only 2 cases. Restoration of vascular continuity is the treatment of choice for both traumatic false aneurysms and arterial-venous fistulas. In the latter both veins and arteries should be repaired when possible.

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MANAGEMENT OF TUBERCULOSIS IN CHILDREN

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MANAGEMENT of tuberculosis in children of servicemen presents numerous problems not entirely soluble by non military standards. The methods used in screening patients, pursuing contacts, conducting mass surveys, establishing a positive diagnosis, initiating well integrated and controlled therapies, and obtaining specific long term follow up observations, all must be correlated and continually modified to meet the demands of the military situation.

This report reviews the results of our experiences in the past 60 months, analyzes methods that have contributed to our difficulties, and offers suggestions for improvement in the treatment of tuberculosis in children, especially at the station hospital level. No attempt has been made to review the extensive literature to compare results or statistics, to enter into discussion of pathogenesis of tuberculosis in children, or to agree or disagree with current concepts relative to drug therapy.

During the 60-month period, from 1 January 1948 through 31 December 1952, 83 children with an average age of 36.3 months, were admitted to this hospital for observation or treatment for tuberculosis. Three of the children were admitted twice, making a total of 86 admissions (table 1). Two of these were a brother and sister who showed disease progression at home and were readmitted for additional therapy. The other had cervical adenitis and was readmitted for tonsillectomy; the tonsils showed tuberculous granuloma. One 10-year old child included in the group with confirmed tuberculosis had bronchiectasis secondary to healed tuberculous lesions.

Because servicemen are continually taught and generally understand the necessity for regular physical examinations for self and family, we should expect less advanced tuberculosis in their children than in a nonmilitary population of comparable size.

Many children were transferred from other military hospitals often after a parent had been admitted with tuberculosis. Usually the child with tuberculosis had been treated without a planned therapeutic regimen or had had no treatment. The early use of streptomycin without a specific therapeutic plan has resulted in difficulty of obtaining a positive culture later. Accuracy of transfer diagnosis is an important problem because transportation is costly. The fathers of some of the 15 children who were admitted with a diagnosis of tuberculosis (table 1) which was not substantiated were unnecessarily transferred to this area. Often children who were not acutely ill arrived without their hospital records for direct admission rather than for transfer. Inquiry into the history, specific treatment received, laboratory findings, and the roentgenographic trend disclosed that the parents were uninformed and were only concerned whether or not their child

TABLE 1 Admissions of 83 patients

	Number of patients
Admitted with diagnosis of tuberculosis	62
Not confirmed	15
Admitted with tuberculosis, but later found to be without	1
Admitted with tuberculosis, but later found to be confirmed	3
Admitted for observation, but later found to be confirmed	2
Total	83

These patients were admitted to the

had tuberculosis. Reduplication of all examinations or waiting for clinical records from previous installations involved costly hospitalization. The child's health may be jeopardized if chemotherapy is delayed until such information is obtained. Material from gastric washings and urine for culture was obtained from all patients on admission. Treatment was not delayed, however, until the results of these tests were reported if other evidence supported the diagnosis of tuberculosis.

GENERAL OBSERVATIONS

About 77 percent of the contacts were known or suspected of having tuberculosis (table 2). Suspected contacts were household servants in foreign countries where the children had lived.

(Germany, Alaska, Japan and Trieste, all areas of high tuberculosis incidence) The diagnosis of tuberculosis was subsequently confirmed in the mother, father, or a close relative of 52 patients. Thirty four (20 mothers and 14 fathers) of this latter group have been treated at this hospital.

TABLE 2 *Observation of patients contacts*

Contact	Number	Number under treatment
Mother	28	0
Father	15	14
Relatives	9	unknown
In foreign country	10	unknown
Friend	2	unknown
Unknown	19	unknown
Total	83	34

Primary contacts of 83 patients with 86 admissions not including the double contacts. Of mother with contact for five children and two mothers were the contact for two children.

The average duration of hospitalization including 21 patients who remained on the ward as of 31 December 1952, was 162.3 days.

The types of tuberculosis encountered are given in table 3. Pulmonary lesions were most frequent and miliary and miliary meningeal tuberculosis were the next greatest single group.

SYMPTOMS AND PHYSICAL FINDINGS ON ADMISSION

Twenty seven patients with tuberculosis were asymptomatic (table 4). The positive roentgenographic evidence of the disease was obtained as a result of the contact survey. Only 18 of the 44 symptomatic patients had specific symptoms (cough, wheeze, pain, night sweats, fever, coma, or convulsions). Primary tuberculosis is more often than not free from specific signs and symptoms and complete examination of those children in whom tuberculosis is suspected is important. Only 50 patients had detectable physical findings on examination.

Diagnostic procedures at this hospital included a detailed history searching for contacts and past respiratory infection, an intracutaneous tuberculin test, complete blood count, sedimentation rate, urinalysis and a roentgenographic examination. Three fasting gastric washings and a 24 hour urine specimen were secured for culture for acid fast bacilli.

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TABLE 1 Adm s d g n o / 83 p t n t

	N m b e r p t t
Adm t t d w t h d g s f t u b e l C f m d N t c f i r m d	62 15
Adm t t d w t h h l e d t b e l u l w t h b n c h t s	1
Adm t t d w t h o t h d g o s T b e u l n f i r m d	3
Adm t t d f o r o b r v t T b e l c o n f i r m d	2
Total	83

The pa t w d m i d t w

had tuberculosis. Reduplication of all examinations or waiting for clinical records from previous installations involved costly hospitalization. The child's health may be jeopardized if chemotherapy is delayed until such information is obtained. Material from gastric washings and urine for culture was obtained from all patients on admission. Treatment was not delayed, however, until the results of these tests were reported if other evidence supported the diagnosis of tuberculosis.

GENERAL OBSERVATIONS

About 77 percent of the contacts were known or suspected of having tuberculosis (table 2). Suspected contacts were household servants in foreign countries where the children had lived

LABORATORY FINDINGS

Positive cultures for tuberculosis in children have often been sought but infrequently found. Nineteen of the children with positive roentgen evidence of primary disease and positive tuberculin reactions had positive cultures or positive guinea pig inoculations. Many pediatricians believe there is no reason for isolation and treatment of the uncomplicated disease in children. However, a child was infected by someone with tuberculosis and although he usually expectorates very little, he swallows great quantities of sputum, and may spread the disease through oral contacts. If coughing is present he certainly should be kept under closer surveillance in order to decrease the likelihood of dissemination to others.

The erythrocyte sedimentation rate was used as one index of activity. Elevated sedimentation rates (Wintrobe, corrected) were present in 38 of the 83 patients. Positive urine cultures were not obtained on any patient.

TABLE 5 Results of tuberculin skin tests

P t i e n t s w i t h d i a g n o s i s	T u b e r c u l i n t e s t			T o t a l
	P o s i t i v e	N e g a t i v e	N o t r e c o r d e d	
A c t i v e t u b e r c u l o s i s	66	3	2	71
N o t t u b e r c u l o s i s	1	14	0	15
T o t a l	67	17	2	86

Negative second or third tuberculin (0.005 mg)

Three children had two admissions each

Results of tuberculin skin tests are noted in table 5. Fifteen patients were admitted (directly or by transfer) with the diagnosis of tuberculosis, the tuberculin test was subsequently negative and no active disease could be demonstrated. If a child is suspected of having the disease, the investigating physician should do and interpret the tuberculin skin test, preferably using the purified protein derivative (PPD first strength - 1:10000, O.T.). The patch test is subject to a wide range of variation in interpretation and is not advised.

Only three children who were definitely considered to have tuberculosis had negative tuberculin skin tests. Also in two patients tuberculosis was demonstrated when a tuberculin test had not been done or the results not recorded.

Failure to recover acid fast bacilli has not deterred us from treating any child who had contact with a tuberculous patient, a

positive tuberculin skin test and whose chest roentgenograms showed evidence of the disease Lichtenstein and Bettag offer rather convincing arguments to the contrary Failure to treat these children may invite disaster however, through increased pulmonary or endobronchial spread with hilar node erosion resulting in miliary dissemination including meningitis Early adequate chemotherapy does not stop all progression but it may prevent disastrous spreads in many instances Once therapy was initiated in a child with miliary disease meningitis did not develop Adequate posttreatment follow ups in these children present problems consequently definitive treatment is initiated in practically all children

PSYCHOLOGIC FACTORS

It is important that the hospital meet the child's needs for parent figures as completely and naturally as possible because as Langford indicated prolonged hospitalization and separation from the home situation are almost sure to leave an indelible mark on the child Visiting rules are being relaxed in an effort to bring the children and parents together more frequently

Play periods were provided and children with tuberculosis of a similar degree played together The performance of tasks responsibilities school work and other activities was encouraged within limits of the child's well being Kind affectionate and industrious professional and nonprofessional personnel staff are needed on the pediatrics ward Such persons are the ones who help the children to speak (masks worn by personnel may create a serious handicap to proper speech development) who drop in for play and who provide surprises they will enjoy and expect All but the more seriously ill children entered into this atmosphere almost immediately after admission to the hospital

The occupational therapists were invaluable in carrying for ward many of these extracurricular activities Daily supervised play periods permitted better socialization among the children Rest periods became quieter and breakage of toys windows window shades et cetera decreased in direct proportion to the availability of such activity

A qualified teacher was obtained and classes were conducted five days a week for children of school age

The Volunteer Gray Ladies were most welcome because they always were helpful in this program

COMPLICATIONS

Complications were few and developed in only three patients during their hospitalization Pleural effusion which cleared fol

lowing thoracentesis obstructive emphysema, which cleared immediately following bronchoscopy and a retropharyngeal abscess which was cured by treatment

Treatment complications, consisting of eighth nerve deafness and vestibular involvement, occurred in five patients. These cleared promptly on cessation of the drug. Two children were re-treated, without further recurrence, after a rest period.

Complications that developed prior to admission included all those tuberculous lesions not specifically limited to the lung parenchyma (excluding enlarged hilar nodes). Endobronchial disease which was diagnosed only on bronchoscopic examination, was noted in six patients on admission. It was likely present in more children, but went undiagnosed because bronchoscopic examination was omitted unless evidence of obstruction was present. The endobronchitis cleared in all patients with the administration of streptomycin and para-aminosalicylic acid. Only one patient had evidence of residual damage. The right middle lobe orifice could not be visualized in this child and a lobe resection at a later date may be necessary.

Bronchoscopy requires the skill of a well-trained bronchoscopist and even then is a formidable procedure.³ On two occasions, laryngeal edema with stridor developed as a sequela and was promptly relieved each time by steam inhalation. If obstruction is present, therapeutic bronchoscopy, as frequently as indicated, is justified. If the roentgenograms show progression of the disease, bronchoscopic examination should be done. No attempt was made to modify the selected treatment protocol because of the presence of endobronchial disease and results were gratifying.

METHODS OF THERAPY

There is a close relationship between the pediatric and the tuberculosis sections of the medical service in the therapeutic management of children with tuberculosis. Each new admission was presented by the pediatric section to the tuberculosis therapy board, and a joint decision was arrived at concerning therapy. This joint board also rendered decisions on changes in treatment protocol, discontinuance of therapy, and disposition of each pediatric patient. Both services found this arrangement mutually beneficial; it provided an opportunity for the phthisiologists to observe pediatric problems, and afforded the pediatrician a ready contrast with the problem of tuberculosis in adults. It further enabled the application of newer advances in chemotherapy as they were reported.

Many varieties of therapeutic management were used during the 60 months. The combined intermittent streptomycin—para-amino-

salicylic acid regimen was particularly adaptable for treatment of the primary disease in children. A single injection of 0.5 gram of streptomycin every three days was given to children under five years of age; thereafter the dose was increased to 1 gram every third day unless the child was small for his age or developed evidence of toxicity. Para-aminosalicylic acid was given three times daily to tolerance. The daily amount tolerated by a 30-month old child was about 4.5 grams and 6 grams for a five year old child.

In the beginning few children tolerated para-aminosalicylic acid satisfactorily. Small dosage schedules were preferred when treatment was begun with graded increments allowing two to three weeks to reach maximum tolerance levels. Lincoln encountered difficulty in administering para-aminosalicylic acid and used thiazolsulfone (promizole) in lieu of it. Other routes of para-aminosalicylic acid administration have been attempted when the oral route failed. Intravenous administration is usually limited because of problems attendant to prolonged daily intravenous therapy in small children. Subcutaneous administration has been attempted but induration at the site of injection developed rapidly despite the addition of hyaluronidase.

MILIARY TUBERCULOSIS AND MENINGITIS

Miliary and miliary meningitis tuberculosis were treated daily with streptomycin and para-aminosalicylic acid. All patients with miliary disease except three who were treated early in this series also had meningitis on admission and the standardized regimen for these children according to age and size consisted of a single injection of streptomycin (0.5 to 1 gram) daily and para-aminosalicylic acid to tolerance. Daily chemotherapy was continued until the spinal fluid was normal for two successive months; there was roentgenographic evidence of complete resolution of all miliary lesions and the child appeared clinically well. Combined intermittent treatment was then continued for an additional six months using the protocol for primary disease and was followed by six months of hospital observation.

During the last three months of the survey isoniazid (isonicotinic acid hydrazide) was used to a limited degree.

It was in the management of meningitis that our protocol departed most widely from the program used in many pediatric centers. Intrathecal medication was not used except in one patient early in this study. Streptomycin levels in the cerebrospinal fluid above 10 μg per cc was obtained by intramuscular administration of the drug and a close correlation was shown to exist between this therapeutic level and the progress of recovery. Of the utmost importance was continuation of the treatment for an

adequate period of time, best determined by clinical and laboratory evidence

During the final six months' observation in the hospital monthly blood counts, sedimentation rates, roentgenograms, and spinal fluid examinations were completed. If a reversal in clinical or cerebrospinal fluid findings occurred, daily treatment was reinstituted and continued until again normal for two successive months.

DISPOSITION AND FOLLOW UP CARE

Disposition of patients admitted are tabulated (table 6). On the last day of this study, 24 patients remained in the hospital; none of these were repeat admissions. The other 62 admissions had been disposed of by various discharges; 54 were discharged with maximum hospitalization benefits (including 15 who did not have tuberculosis). Three patients were transferred elsewhere, two (one died later) to a local sanatorium after the parent had been separated from the service, and the third was transferred to a nearby station hospital at the father's request. Two went home, against advice, one because the father had a permanent change of station, the other due to a lack of understanding the seriousness of tuberculous lymphadenitis.

TABLE 6 Disposition of 83 patients

Discharged with arrested tuberculosis	39
Tuberculosis not proved	15
Transferred elsewhere (one died after transfer)	3
Returned home against medical advice	2
Died in hospital	3
Remained in hospital	24
Receiving treatment	
Miliary and/or meningeal	6
Pulmonary	14
Posttuberculous	4
Total	86

The patients were admitted

The status of patients with miliary and/or meningeal tuberculosis is shown in table 7.

All four deaths occurred in patients with meningitis and three of them occurred early in this study. One patient was admitted in a terminal state and lived only one month. Another, hospitalized

over two years had arrested miliary and meningeal tuberculosis and died of inanition and pneumonia, but no evidence of active tuberculosis could be demonstrated at autopsy. The third patient had a sudden onset of the disease and rapidly deteriorated despite the use of intrathecal streptomycin therapy (the only patient in this series to receive continuous intrathecal streptomycin). The other patient, a two year old girl died in a local sanatorium seven months after transfer. The mortality rate of the 83 patients in this series was 4.6 percent while the corrected mortality rate for those with tuberculosis (excluding five patients who were lost to observation) was 6.35 percent compared to 23.5 percent for those who had miliary or meningeal involvement.

TABLE 7 R ult f m l ry nd/ m ge l tub ul ch ld

St t f p t t	N mbe f pat
D d (o ft tr n f)	4
D ha g d f m ho p t l	8
L tha 1 ye r	3
F m l t 2 y	2
N f l l w p fte 12 m th	3
R ma g w d	5
D as n t t	
L tha 1 y	2
F m l t 2 y a	1
D as a t	
L th 6 m th	2
T t l	17

Of the 39 patients discharged with tuberculosis only 24 were followed from one month to two years and all have remained well. Long term follow ups are most valuable and necessary to gain information relative to the development of pulmonary tuberculosis in adolescence as well as a guide for interpreting subsequent changes either clinical or roentgenologic. There were no relapses known to us except in the three children described who were readmitted because of progression of the disease at home. All three readmissions were successfully followed after the first discharge prior to readmission.

One of the reasons why long term follow ups fail in the military service is because the father of the patient gets a permanent change of station necessitating the child going with the parents. Another is that one parent (usually mother) is in the hospital and the father must send the child to the grandparents. Occasionally

the father is discharged from the service during or after his child's illness and such children are almost invariably lost to follow up care

The stability of permanent community life is often denied the serviceman, which adds to the difficulties for providing optimum home care, especially if one parent is hospitalized for tuberculosis. We prefer to treat most children who have had contact with a person who had tuberculosis have a positive tuberculin skin reaction, and roentgenographic evidence of tuberculosis.

The following case reports are representative of the patients observed and problems encountered

CASE REPORTS

Case 1 Progressive primary tuberculosis, endobronchial disease and atelectasis A four year old child was admitted on 24 November 1951 as a transfer from a station hospital. Six months before admission to this hospital a roentgenogram of the chest (fig 1) which was made because a twin sibling died of tuberculous meningitis, was interpreted as showing atelectasis, "not thought to be tuberculous". Two months later she was hospitalized following a head injury. Rales were heard over the right lower chest posteriorly, and a tuberculin patch test was positive. She was discharged and her parents were advised to keep her in bed. Subsequently a roentgenogram showed pneumonia and atelectasis (fig 2). She was hospitalized and gastric washings were positive for tuberculosis on guinea pig inoculations. She was given streptomycin and para aminosalicylic acid intermittently for three weeks and transferred to this hospital. On admission positive findings were dullness and decreased breath sounds over the lower anterior chest on the right side.

Sedimentation rate (Wintrobe) was 20 mm at the end of the first hour. A roentgenogram of the chest showed atelectasis of the right middle lobe and right hilar adenopathy. The first strength tuberculin test was positive. The spinal fluid was normal.

She was continued on 0.5 gram of streptomycin every three days and 1.5 grams of para aminosalicylic acid three times a day. Bronchoscopic examination five days later showed a penetrating caseous node in the right main stem bronchus obstructing the middle lobe orifice, after suctioning a small bronchomediastinal fistula was apparent. A rather wide diurnal temperature fluctuation and elevated sedimentation rate continued for five months. Repeated roentgenograms of the chest revealed only minimal clearing of the atelectasis. Bronchoscopic examination showed complete healing of endobronchial disease without obstruction, except that the right middle lobe orifice could not be

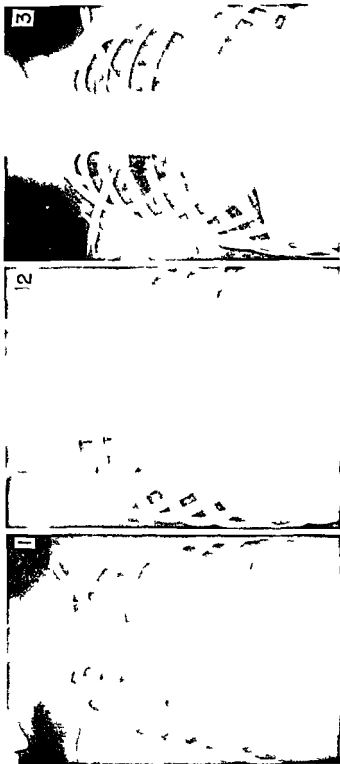


Figure 1 (ca 1) Roe ig nog am t k 31 M y 1951 sh w g p gr p m y t be l w th ght m ddle l b at l ta
 i g w 2 (ca 1) R ig g am t k 24 July 1951 d adm h w s i of the at l ct i Fig 3 (1)
 R ig gr m tak 26 May 1952 t d ha ge how g m l ar g f the t l cias

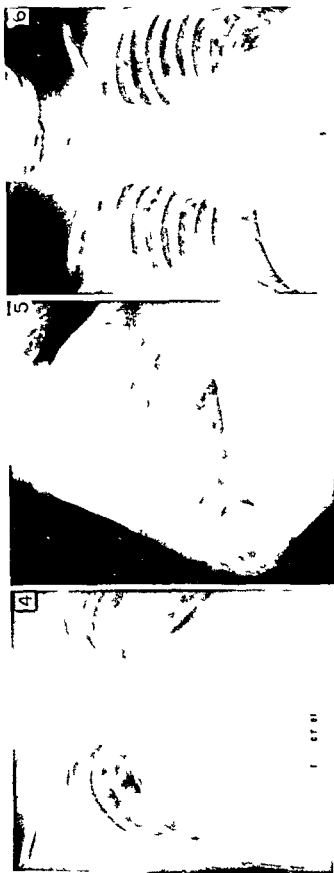


Figure 4 (case 2) Roentgenogram taken on 19 October 1951 showing marked distortion of thoracic cage with evidence of calcium depletion and fibrocystic disease. Figure 5 (case 2) Roentgenogram of spine taken on 25 March 1952 showing extensive kyphosis. Figure 6 (case 2) Roentgenogram taken on 19 May 1952 after eight months of therapy. Marked clearing of pulmonary lesion had occurred.

utilized (fig 3) Chemotherapy was to be continued for an additional three to six months and a segmental lobe resection was considered

Case 2 Progressive primary tuberculosis with Pott's disease
A six year old boy with marked dorsal kyphosis was admitted on 26 October 1951 to this hospital for evaluation At the time his mother was a hospital patient with tuberculosis At 18 months of age when he started to walk he leaned to the right One year later a deformity of the spine became obvious and a diagnosis of tuberculosis of the spine was made at a civilian hospital He was placed in a body cast for six months Subsequently a Hibbs fusion operation was done Following discharge 10 months later he wore a brace until this admission He had not received any chemotherapy

Roentgenograms of the spine showed a well fused kyphotic spine with narrowing of the interspaces from D 7 to L-1 and destruction in the vertebral bodies from D-10 to D 12 There was marked deformity of the thoracic cage and extensive pulmonary infiltration at the right cardiophrenic angle (figs 4 and 5) Sedimentation rate was normal Initially it was considered that the pulmonary infiltration probably represented fibrotic tissue However because he had not received chemotherapy 0.5 gram of streptomycin every three days and 1.5 grams of para-aminosalicylic acid three times a day were given Within one month definite roentgenographic evidence of clearing of the pulmonary lesion occurred and has continued (fig 6) Chemotherapy will be continued until the chest lesion has stabilized

Case 3 Tuberculous meningitis and arachnoiditis A 15 month old boy was transferred on 7 August 1951 to this hospital with a diagnosis of tuberculous meningitis and a history of meningeal irritation for three weeks His father was in the hospital with tuberculosis and the maternal grandmother had died of tuberculosis in the home when the patient was three months old

When examined the patient was in a position of flexion abduction of the thighs with the upper extremities abducted There was a staring gaze with apparent blindness nuchal rigidity and open anterior fontanel without bulging He was extremely irritable resisted movement screamed intermittently as if in pain and had an unsustained bilateral ankle clonus

The spinal fluid contained 190 cells per cu mm (80 percent lymphocytes) glucose 33 mg per 100 cc chloride 620 mg per 100 cc and total protein 5.448 mg per 100 cc The roentgenogram of the chest showed military tuberculosis and the first strength PPD tuberculin test was positive Fluid obtained by a cisternal puncture showed total protein 82 mg per 100 cc

and glucose 62 mg per 100 cc The patient was given 1 gram of streptomycin and 4 to 6 grams of para aminosalicylic acid daily Two weeks after admission a myelography was done and a cohesive arachnoiditis was demonstrated at the level of D 10 (fig 7) Six days later a laminectomy was performed from D 9 to D 12 to remove the adherent arachnoid tissue A single intrathecal dose of 75 mg of streptomycin was given during the operation

The spinal fluid six months after admission showed a cell count of 36 lymphocytes per cu mm, glucose 72 mg, and total protein 75 mg per 100 cc The total protein and glucose content of the spinal fluid were at normal levels 16 months after admission when this survey closed The patient was active in bed and able to sit, stand, and feed himself, and had no evidence of blindness or deafness A roentgenogram of the spine showed a dissemination upward of the initially injected pantopaque (fig 8), and one of the chest (fig 9) revealed little evidence of pulmonary infiltration

Case 4 *Miliary tuberculosis* A six month old infant was admitted on 21 October 1949 to this hospital because of cough, wheezing, weight loss, and increasing anorexia of two months' duration

His mother was hospitalized with active tuberculosis when he was born There was no postnatal contact with his mother but he was kept by his maternal grandmother until she died of tuberculosis, when he was three months old On admission he was a marasmic infant coughing constantly and weighed 10½ lb

Initial tuberculin skin test (one fourth of first strength PPD) was positive Cultures of gastric contents for acid fast bacilli were positive Spinal fluid on admission and before discharge was normal A roentgenogram of the chest showed miliary lesions in both lung fields (fig 10) Streptomycin was given daily for 28 days, discontinued for 28 days, and then resumed for 28 days Clearing of the miliary spread was apparent two months after admission Seven months after admission, bronchoscopic examination showed tuberculous bronchitis Very soon thereafter obstructive emphysema developed in the right side of the chest (fig 11) which was relieved by bronchoscopic aspiration (fig 12) Progressive healing continued, and on discharge, nine months after admission only a calcified right hilar node remained A follow up roentgenogram six months after discharge revealed continued healing he was subsequently lost for continued follow up

METHODS OF TUBERCULOSIS CONTROL SURVEY

It is difficult to establish a permanent tuberculosis control program for dependent children at military installations In the

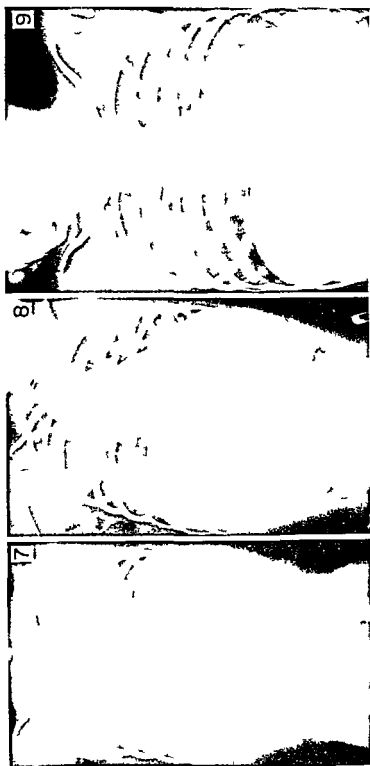


Fig. 7 (ca 3) R ig gram t k 20 A g t 1951 how g d p q mat i l t p mal c al d m i t i g l el of bl k
 Fig. 8 (ca 3) R ig gram t k 20 A g t 1951 how g d p q mat i l t p mal c al d m i t i g l el of bl k
 Fig. 9 (ca 3) R ig gram t k 20 A g t 1951 how g d p q mat i l t p mal c al d m i t i g l el of bl k

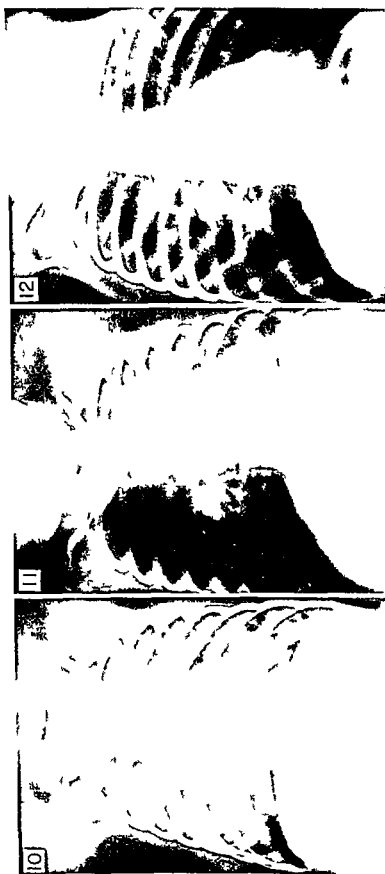


Figure 10 (case 4) Roentgenogram showing extensive tuberculous infection of the lungs with emphysema. Figure 11 (case 4) Roentgenogram showing extensive tuberculous infection of the lungs with emphysema. Figure 12 (case 4) Roentgenogram showing extensive tuberculous infection of the lungs with emphysema. Figure 13 (case 4) Roentgenogram showing extensive tuberculous infection of the lungs with emphysema.

past this has been only partially successful during routine clinic visits summer youth programs and preschool health examinations Frequently no specific note was made concerning contact with tuberculosis All too consistently our past methods did not reach as many contacts as it is possible to reach Because of this the following program was adopted at this hospital in September 1952 and appears effective On 31 December 1952 161 contacts were being followed and none had developed active tuberculosis Of this group 22 have positive tuberculin skin tests four of them were conversions to positive after initiation of the program

All adult patients with tuberculosis admitted to this hospital are interviewed by the educational nurse and social service worker Inquiries are made as to whether or not they plan to bring their children to this vicinity If the children are in the vicinity or are to arrive later their names and addresses are reported to the pediatric section

Routine tuberculin skin tests of all patients are carried out in the outpatient clinic on the initial visit and for newborn infants at the end of the first year Roentgenograms of the chest obtained at this time form an integral part of our health program which is primarily concerned with discovering contacts of patients with tuberculosis

A card file is kept on all persons in the program chronologically according to the month in which he or she is next due for roentgenographic or other examinations These follow up examinations are at three to six month intervals

If a child is to leave the immediate geographic area the parent is given a follow up card stating the diagnosis last roentgenographic findings results of the tuberculin test and the steps required to secure future follow up examinations whether in a military or nonmilitary status

FOLLOW UP STUDIES

The type of follow up studies and their intervals are at the discretion of the pediatrician responsible for the program In general after the initial evaluation tuberculin tests are done at regular intervals on negative reactors among known contacts A change in reaction is cause for further investigation Roentgenograms and sedimentation rates for positive reactors are repeated at six to 12 month intervals Children with tuberculosis are examined monthly for three months after discharge from the hospital then at gradual lengthening intervals About two years after discharge they are examined annually During puberty from 10 to 14 years of age the children should be examined at six month intervals

DISCUSSION

Effective dependent care is essential to troop morale, and at times frequent changes in duty station assignments mitigate against such care. The problem becomes less formidable, however, by localizing the treatment of tuberculosis in children in major army medical centers. Many factors are not exclusively military. Some are in part, a function of the civilian communities such as mass surveys and welfare agencies which direct the proper disposition of eligible military dependents who have suspected or proved tuberculosis.

This hospital has been the tuberculosis center for the armed services for many years and a large number of children with tuberculosis are treated here.

To treat or not treat primary tuberculosis is a debatable question, not yet satisfactorily or completely answered. It is our belief that because of the difficulty in obtaining frequent re examinations and the ever present danger of the occurrence of miliary and meningeal dissemination, all children should be treated vigorously, except those who have very minimal involvement.

It would be a difficult task and not worth the effort, to enumerate all children with tuberculosis admitted and disposed of at every medical installation of the armed services for the period outlined in this survey. Furthermore the methods of diagnosis, treatment, disposition, and follow up would be equally evasive of satisfactory evaluation. The results at this hospital indicate a useful method of diagnosis, treatment, disposition, and follow up. They indicate what has been and is being done to lessen the mortality from pediatric tuberculosis in a large Army hospital. These remarks are not to be construed to mean that these methods should be universally used in military installations, nor are they adaptable in every way to these many facilities. Further, the difficulties in the social and economic spheres of the serviceman's home versus the stable home and community life of his civilian contemporary must be carefully evaluated and every available means enjoined to equalize the differences. Co-operation with the social work service must be firmly established to render assistance in enabling the family to better understand the problems and to facilitate the necessary readjustments posed by the disease and attendant prolonged hospitalization.

SUMMARY

During a 60 month period, 83 children were admitted to this hospital for observation or treatment for tuberculosis, and 68 were found to have the disease. Three children were admitted twice. Early diagnosis and adequate transfer records are essential.

Purified protein derivative (PPD) intracutaneous test is easily administered and extremely valuable. Fourteen patients who had not had a tuberculin skin test at the home station were subsequently found not to have tuberculosis. The number of known contacts was high and 84 of the parents of the 83 patients were or had been under treatment at this hospital.

Cultures for acid fast bacilli were positive in less than 25 per cent of the patients admitted and an elevated sedimentation rate was present at some time in 40 percent.

Any child who had contact with a person with tuberculosis a positive tuberculin skin test and roentgenographic evidence of the disease was treated. The use of the combined intermittent streptomycin and para aminosalicylic acid regimen is the treatment of choice except for the military or military meningeal group who received streptomycin and para aminosalicylic acid daily as outlined and more recently daily isonicotinic acid hydrazide has been added to this program.

Six patients had endobronchial disease which showed complete healing on bronchoscopic examination. In one of these the right middle lobe bronchus was never visualized despite clearing of the endobronchial disease.

The occupational therapy section of the physical medicine service as well as the Gray Ladies are integrated into the plan of treatment. This is of inestimable value in aiding the children to progress as normally as possible.

Of the 83 patients four with meningitis died five were transferred 39 were discharged with arrested tuberculosis 24 remained on the ward at the close of the survey and no tuberculosis could be demonstrated in 15.

A tuberculosis contact survey and control program was established to facilitate better supervision of the children of tuberculous servicemen or their wives.

Despite the small series the results are gratifying and it is believed that such a program is adaptable with local modifications to any medical installation of the armed services.

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BIOLOGIC TESTS FOR PREGNANCY IN ARMY AREA LABORATORIES

Comments on the Chorionic Gonadotrophin Test With Serum

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DWIGHT M. KUHN *Colonel MC USA*

THE demand on medical laboratories for biologic tests for pregnancy has increased sharply in recent years. In the armed services this has been due largely to the expiration in 1948 of the Emergency Maternal and Infant Care Program. In the same year internships and residencies in obstetrics and gynecology were established at named army hospitals. The introduction of the frog* tests with their simple technic and speedy results also contributed to the increased popularity of this laboratory procedure among clinicians.

The responsibility for the performance of most pregnancy tests in the Army belongs to the six army area laboratories in the zone of the interior and to medical general laboratories overseas, in addition to the named army hospital laboratories. In general the Aschheim Zondek, Friedman-Hogben and *Rana pipiens* tests are used.

In an effort to develop a uniform method of pregnancy testing throughout the Army, comments and recommendations on this subject from various army area laboratories were requested by the Office of the Surgeon General. The following is a summary of the data obtained.

FIRST ARMY AREA MEDICAL LABORATORY

The First Army Area Medical Laboratory performs the Friedman and male frog tests. The former requires virgin female rabbits and the latter male *Rana pipiens*. In the performance of the male frog test the frog is injected via the dorsal lymph sac with 1.0 cc of concentrated urine of the patient. (The most widely used

Xenopus laevis is considered to be a South African toad by some authorities and is defined by others. The female of this species is used, where the male *Rana pipiens* is required for the tests.—Editor

From the First, Second, Third, Fourth, Fifth and Sixth Army Area Medical Laboratories. Submitted by M. J. Benit, assigned to the 9th U. S. Army General Hospital APO
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method of concentration is the Cutler modification of the Scott technic. The animal is examined every half hour for three hours for evidence of the presence of sperms in the cloaca. Frogs that exhibit a positive reaction are not used again, but those with a negative reaction can be used again after 24 hours.

The First Army Area Medical Laboratory modifies this procedure. If the specific gravity of the urine is 1.015 or more, 50 cc are used and diluted to 100 cc with water; if 1.010 to 1.014, 100 cc are used. If the specific gravity is lower than 1.010, it is

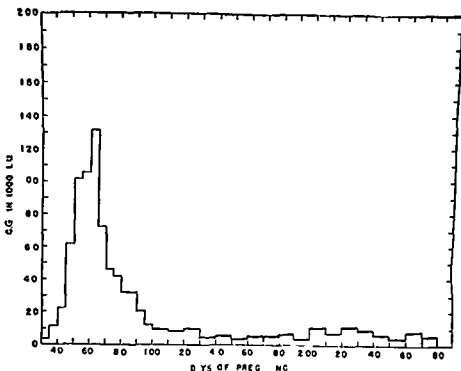


Fig. 1. A. Ag. c. nc. t. at. on. of. erum. g. nad. t. oph. at. va. us. tim. s. normal. p. gnancy. ba. d. 24. ca. F. m. E. tm. n. N. J. W. ll. m. Ob. t. c. 10th. d. t. on. Appl. ton. Ce. tury. Croft. Inc. N. w. Y. k. N. Y. 1950. p. 160. (Ad. pt. d. f. m. J. ne. G. E. S. D. ll. E. and. St. an. H. M. Cho. so. gonadotrop. and. p. gna. disol. alue. ormal. pr. gna. cy. B. ll. J. h. H. pk. H. p. 75. 359. 376. D. c. 1944.)

better not to use the specimen, however, results can be obtained by doubling the concentration or the amount of concentrate injected into the frog. The frog is given 2.0 cc of the concentrate. If the reaction is negative after one hour, 2.0 cc of a known positive concentrate is injected. Results are reported as one half of the number of sperms observed per high power field.

This laboratory has done about 1,500 of these tests and noted only six or seven discrepancies. One was a case of pseudocyesis.

which explained the repeated "false negative" tests obtained. In another case of obvious pregnancy, "false negative" tests were obtained in the latter part of the pregnancy. However, it is well known⁶ that the chorionic gonadotrophin hormone level falls sharply 120 or 130 days after conception and remains low for the remainder of the pregnancy (fig 1) so that a large number of tests performed late in pregnancy give "false negative" results.⁷⁻¹¹

The time required for the performance of this test is about 40 minutes for the concentration of the specimen, four minutes for each injection, and seven minutes for each microscopic examination. Results are usually obtained from 30 minutes to four hours.

SECOND ARMY AREA MEDICAL LABORATORY

The Second Army Area Medical Laboratory currently uses the *Xenopus laevis* test, or so-called Hogben test, modified by the use of serum with the technic developed at this laboratory by one of us (G. W. P.).¹² The Rosenfeld³ method was tried originally but found to be time consuming. Aschheim Zondek, which is performed primarily for quantitative hormone assay studies and Friedman tests are resorted to when there is a shortage of clawed frogs.

Two cubic centimeters of clear serum collected under sterile conditions, are injected into the dorsal lymph sac of the female clawed frog and repeated two hours later. The frog is then placed in distilled water in a standard incubator and examined 18, 24, and 48 hours later. Results at this laboratory¹² indicate that temperature and pH of the water are critical factors which markedly affect the sensitivity to the test.

About 99 percent of the positive results are observed in from six to 18 hours. The other one percent are delayed positive results appearing up to 48 hours later. The production of eggs is an end point which requires no special training or equipment to detect. These eggs are fairly large in size, varying from 3 to 5 mm in diameter. The production of a single egg is considered a positive test. Congestion and hyperemia of the cloaca are suspicious signs. In such a case a second frog is injected after 24 hours, if enough serum is available; otherwise, the test is reported as inconclusive and a second specimen requested.

Those frogs giving a positive test are rested from 16 to 18 days. Because some frogs continue to produce eggs for several days, it is necessary to keep them a period of time in the distilled water and incubator. Frogs showing negative tests are used after one week, but if necessary, they can be used again after 48 hours. A master chart is maintained to indicate which

frogs are ready for use. In addition, an individual record is kept on each animal giving its complete history from the time it was received in the laboratory and indicating its number, weight, the date of each test performed on it, and its result.

The time required for the performance of this test is about five minutes for each injection plus the short time for each examination. Results are usually reported in from 24 to 48 hours.

THIRD ARMY AREA MEDICAL LABORATORY

The Third Army Area Medical Laboratory performs the male frog (*Rana pipiens*) test similar to that already described with the following modifications. During the concentration procedure the hormone is separated from the koalin by addition of 1.5 cc of 0.1 normal NaOH. If no spermatozoa are found after three hours the frog is injected with a known positive concentrate to ascertain its ability to react. If no spermatozoa are found one hour after injection of the known positive, another frog is used.

The frogs are kept in a refrigerator at 10 °C in standard animal jars in one inch of distilled water to which 20,000 units of penicillin are added. Not more than 10 frogs are placed in a jar. The animals are removed from the jars, placed in glass screw-top containers, and kept at room temperature for an hour prior to injection. All frogs are examined for sex and the presence of spermatozoa when received and prior to use. This laboratory has noted that the sperm count decreases during the summer months.

FOURTH ARMY AREA MEDICAL LABORATORY

Two types of pregnancy tests are performed at the Fourth Army Area Medical Laboratory. The Aschheim Zondek test is used for all routine specimens, and the Friedman test for rapid testing. The procedure used for the Friedman test is the same as that described by Kolmer and Boerner, except that 20.0 cc of urine are injected subcutaneously instead of 10 cc intravenously. This modification reported by Ducey gives results that are as reliable as those obtained by the standard method and has the advantage of simplicity and of avoiding toxicity in animals.

The procedure used for the Aschheim Zondek test is the same as described by Simmons and Gentzkow, except that only three mice are used for each test and four injections of urine are given subcutaneously in 48 hours. Each mouse receives 0.5 cc of urine per injection for a total of 2.0 cc.

No difficulty has been encountered with either test other than that the urine is occasionally still toxic for mice after detoxification.

FIFTH ARMY AREA MEDICAL LABORATORY

The Fifth Army Area Medical Laboratory routinely uses the *Xenopus laevis* test with the serum technic of Rosenfeld and reports that the simplicity, accuracy, speed and generally satisfactory results of the test, coupled with the comparatively low cost, favors its retention

Aschheim Zondek and Friedman tests are reserved for quantitative determinations and as alternate tests in the event of shortage of clawed frogs

SIXTH ARMY AREA MEDICAL LABORATORY

The Sixth Army Area Medical Laboratory has abandoned the *Xenopus laevis* in favor of the male frog test for pregnancy because it is more economical and requires less time. Mice are used for quantitative tests, but *Rana pipiens* are being investigated for this purpose

DISCUSSION

In an army area laboratory the biologic tests for pregnancy are not usually of emergency nature whereas in a hospital the results are often desired within a few hours. Specimens are usually from two to four days in the mail in transit to most area laboratories. When necessary air transportation is available but there is still a delay of several hours before the specimen reaches the laboratory. Obviously, the surgeon who has a young woman under observation with an acute abdominal condition cannot wait several days for a laboratory report. Thus the necessity for a rapid method of pregnancy testing does not involve an army area laboratory

Because speed is not of paramount importance, the ideal test for an area laboratory is the one most economical, simplest in technic, and requiring a minimum of the technician's time. It is our opinion that the *Xenopus laevis* test using serum meets these requirements best. It has a number of advantages over the male frog test.

1 Because most specimens are sent by mail a saving in shipping space and expense occurs. The use of serum requires a 5 cc specimen, compared to the 100 cc for the male frog method. The latter method also involves the additional expense of returning the empty containers, a step involving two man hours a week.

2 The use of serum provides a sterile specimen which decreases the chance of the frog's death because voided urine is not sterile. There are also reasons to suspect that bacterial

contamination may be one of the causes for loss of hormone in urine specimens

3 The toxicity problems associated with the use of urine are avoided by using serum

4 The use of serum provides personal identification of the patient by the physician submitting the specimen This advantage may be of medicolegal importance when it is imperative to maintain an unbroken chain of evidence

5 The technic of the *Xenopus laevis* test with serum is simple so that a skilled technician is not required

6 The time consumed in the performance of this test is far less than that required by the male frog method

7 Only six percent of the circulating hormone is excreted in the urine whereas 94 percent is endogenously destroyed The ratio of the concentration of hormone per cc in serum and urine at any time during pregnancy is about 3 3 1 0

8 Although the problem of seasonal variation in the response of the *Rana pipiens* to gonadotrophins has not been definitely elucidated no such problem is experienced with the *Xenopus laevis*

9 Experimental evidence¹ indicates that the *Xenopus laevis* is the only animal currently used for pregnancy testing that does not react to the follicle stimulating portion of the pituitary or the naturally occurring ovarian hormones Accordingly this test never gives false positive results

10 Although the initial cost of a *Xenopus laevis* seems large when the expense per test is calculated considering the number of tests possible per frog, then the cost per test using the *Xenopus laevis* is actually less than the test using the male frog The cost of each *Rana pipiens* is about 50 cents If only one frog is used the cost would be 50 cents per test but when two frogs are used for each test the cost would be about 75 cents per test This is based on the assumption that half of the tests are negative in which case one of the frogs is given an injection of a known positive specimen and only those giving a positive reaction are discarded

In the experience of the Second Army Area Medical Laboratory with the *Xenopus laevis* each frog can be used for an average of six or seven tests during its lifetime of about six months The expense of keeping the animals is small The cost of each frog is about four dollars Therefore the cost per test with the *Xenopus laevis* considering unexplained deaths of animals as well as preventable laboratory accidents other than epizootics would be about 60 cents

It is obvious that the test using the *Xenopus laevis* is more economical when the cost is computed on the number of tests that can be performed on each animal. Other advantages of the *Xenopus laevis* test over the male frog test include a saving of glassware and chemical reagents, and in addition, fewer microscopic examinations are required and the demands on the technician's time and skill in completing the test are appreciably reduced.

The accuracy of the *Xenopus laevis* test, employing serum compares favorably with all other procedures. At the Second Army Area Medical Laboratory, the test was 99.2 percent accurate on the basis of clinical follow up in 122 cases. However, the patient must not be less than 21 days, nor more than 67 days, past her expected menses (fig 1), and the serum must be sterile and free of hemolysis, or the results of a test using the *Xenopus laevis* will be unsatisfactory.

In a series of 122 determinations eight tests were in disagreement with the clinical findings. Four of these specimens were submitted too early in the pregnancy (three patients were only 11 days past their expected menses and one was 17 days past). Three specimens were submitted too late (two patients were 69 days and one was 86 days overdue). The eighth specimen was from a patient with a threatened abortion; the test was negative on her admission to the hospital, but was positive a week later. In 45 patients, in whom pregnancy was subsequently proved by clinical findings, the test gave positive results.

SUMMARY

The present status of the biologic tests for pregnancy in army area laboratories has been reviewed. The merits of the male frog (*Rana pipiens*) test with urine and *Xenopus laevis* (Hogben) test employing serum were compared, and the economy, simplicity of technic, accuracy, and speed of performance favors the *Xenopus laevis* test with serum as the ideal method for use by an army area laboratory.

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Contributions of Paul Ehrlich

Most great men in medicine are remembered because their names are connected with one fundamental discovery with the description of one or several diseases with important symptoms or signs or with technical or operative procedures. Paul Ehrlich's contributions to medicine are so numerous that it is not possible to link his name with one particular achievement. In hematology, in immunology and in chemotherapy (a means of treatment which he originated) Ehrlich established many basic facts, developed a number of fundamental methods and coined a multitude of terms that have become the common property of the medical profession. They are used so frequently that the name of Paul Ehrlich now is seldom quoted in this connection.

—HANS C. S. ARON, M.D.

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p. 969 Mar. 20, 1954.

THE USE OF FLAME PHOTOMETRY IN THE CLINICAL LABORATORY

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KENNETH F ERNST *Colonel MC USA*

SINCE the advent of commercial flame photometers in 1945 the routine determination of sodium, potassium,¹⁻¹⁰ and more recently, calcium^{1, 10-17} in blood serum and urine by this instrument has become very useful. This quantitative analytic technic is rapidly replacing the time consuming gravimetric and titrimetric methods. Many more analyses can be done without additional laboratory technicians and more pathologic electrolyte abnormalities can be found because sodium, potassium, and calcium determinations by flame photometry require less than 30 minutes. The rapid determination of electrolytes in patients with anorexia, diarrhea, vomiting, tetany, acidosis and renal abnormalities are extremely helpful to their treatment.

During 1953 at this hospital, complete electrolyte studies were made on blood serum, urine, and bath fluids of five patients who had been treated with the artificial kidney, and the results were available within a few minutes after the specimens were obtained. These quantitative studies are the only known methods for obtaining and following the exact electrolyte status of these patients. Unknown at the time the patients were admitted, 20 routine blood specimens were revealed to be low, or dangerously high, in potassium content, 15 were low in calcium, and five in sodium.

THEORY AND ACCURACY

The principal steps in flame photometry are the atomization of the diluted sample of serum or urine into the flame, isolation of the characteristic spectral emission of the element desired and detection and measurement of this emission.

Flame photometers for use in the clinical laboratory are now available at moderate prices. Some instruments are more versatile than others because basically they are spectrophotometers and can be used for other chemical measurements such as absorbency, fluorescence, or turbidity. The addition of such an attachment is

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not expensive in those laboratories already employing a spectrophotometer for which flame attachments are available. Only a few feet of bench space for a flame photometer are required and a small area for gas tanks and air compressor if these are needed. A special room is ideal but not necessary for the apparatus. Contaminants present in the air can virtually be eliminated by an air cleaner and precipitator which is easily attached. Closed burner systems are now available on most instruments. Bottled

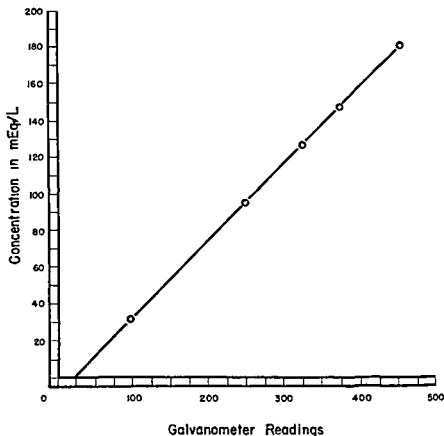


Fig. 1 Calibration curve for the flame photometer and standard solution of 1000 ppm lithium chloride (5 ml per 50 ml total). Standard lithium chloride concentration 142 mEq/L.

or city gas and a source of compressed air can be used for the emission of the sodium and potassium atomic spectral lines. For the more difficult emissible calcium line, fuel gas (hydrogen or acetylene) and oxygen are required.

The flame photometer with a chamber into which the sample is sprayed before it passes to the burner and the type in which the

sample is sprayed directly into the flame without a separate chamber are satisfactory for routine clinical work. The measuring system of the flame photometer is composed of one or more photo-detectors with or without an electronic amplifier, and a null or direct-reading galvanometer. Barrier layer cells and photomultiplier tubes are now available to increase the sensitivity of the detectable light emitted from an element. Interference filters are available for some instruments. The photomultiplier tube has

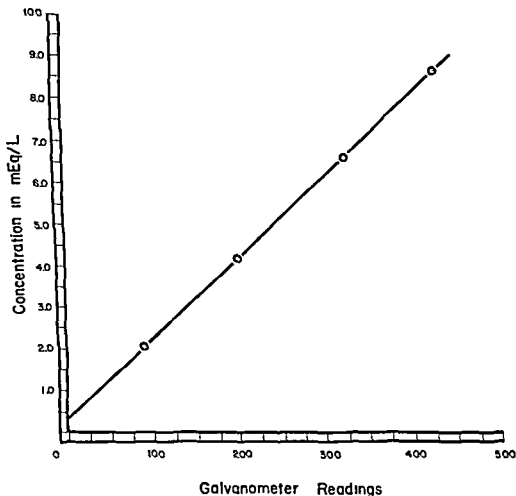
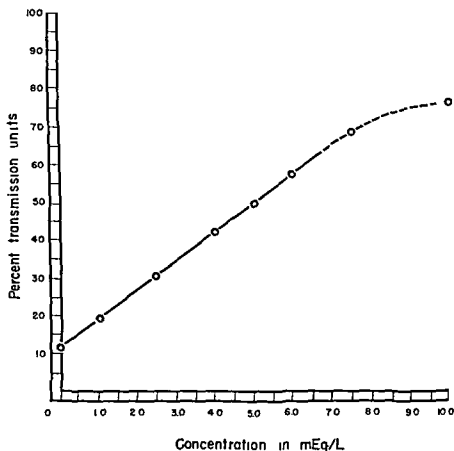


Figure 2 Calibration curve for potassium in blood serum and in urine at dilution of 1/100 blood serum and 1/500 urine using the internal standard solution as follows: Standard stock solution contains 5.0 mEq/L of potassium as potassium chloride.

made the quantitative determination of calcium possible on 0.1 ml of untreated samples of blood serum and urine.^{16, 17} The routine determination of magnesium⁶ has not yet been standardized because the results on ashed samples have not been uniformly satisfactory.¹⁸

All samples must be in solution and the flame emission compared with that of standard solutions of the element to be determined. Figures 1 through 4 are examples of calibration standard curves obtained in this laboratory. The sodium and potassium curves were obtained on the Barclay instrument by using an internal standard of lithium sulfate. The calcium curves were obtained on the Beckman DU instrument with flame and photomultiplier attachments. Standard calibration curves must be



Figur 3 Calibration curve for calcium in serum

plotted daily. In the calibration curve for calcium in serum at dilution 1/50 (diluent glacial acetic acid, acetone, and Sterox which is essentially the organic solvent described by G. R. Kingsley and P. R. Schaffert at the 123d National Meeting of the American Chemical Society, Los Angeles, Calif., March 1953), the standard stock solution contains 142 mEq/L of sodium as sodium chloride, 50 mEq/L of potassium as potassium chloride, 20 mEq/L of magnesium as the metal, 47 mEq/L of phos

phorous as $(\text{NH})_2\text{HPO}_4$, and 5.0 mEq/L of calcium as calcium carbonate. The standard solution alone without calcium reads 14 percent transmission units. The organic solvent alone reads 13 percent transmission units (fig. 3). In the calibration curve for calcium in urine at dilution 1/50 (diluent same as for blood serum) the standard stock solution contains 133 mEq/L of sodium as sodium chloride, 42 mEq/L of potassium as potassium chloride, 8.3 mEq/L of magnesium as the metal, 48.2 mEq/L

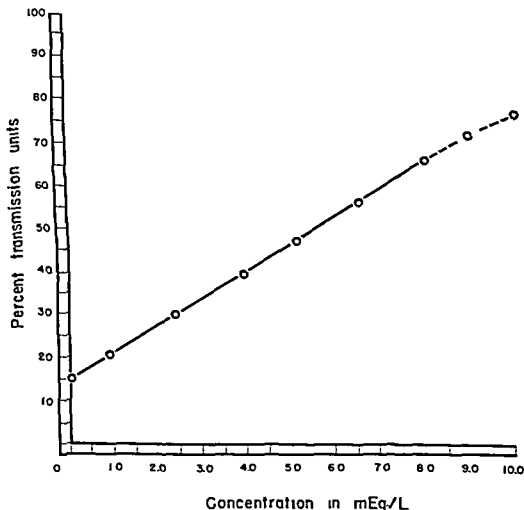


Figure 4. Calibration curve for calcium in urine

of phosphorous as $(\text{NH})_2\text{HPO}_4$, and 5.0 mEq/L of calcium as calcium carbonate. The standard solution alone without calcium reads 13 percent transmission units. The organic solvent alone reads 12 percent transmission units (fig. 4).

Results are dependent on the accuracy of the standard solutions and the cleanliness of the glassware. Most instruments can yield analytic results with an average error of less than five percent of the amount present.^{2,3} The average error in deter

mination of urine calcium is about 10 percent of the amount present. This error is presumably due to the urinary phosphates which depress the calcium emission. The internal standard when used corrects instrumental fluctuations to some extent and helps the effect of various constituents on the drop size distribution and fraction of spray reaching the flame (in instruments employing a spray chamber). The internal standard does not curb radiation interference which is the most troublesome factor in the flame. The flame emits light continuously throughout the spectral range (flame background) so that the ratio of light emitted by an element to the background light of the flame is of considerable significance.

TABLE 1 *Value of sodium, potassium, and calcium blood serum and urine of normal persons obtained by various methods using flame photometry*

Investigator	Year	Number	Diet	Specimen	Range mEq/L	Mean mEq/L
Cholkin and Hildbrand	1944	N 8	N	U	N 8	170
			K	U		56.4
			C	U		1.75
Ellis and Holliday	1951	400	N	Serum	135-155	144.7
			λ	Serum	3.1-5.5	4.18
Hald	1947	N 8	N	Serum	130-145	
			λ	Serum	4.2-4.9	
Mason and soci	1947	107	N	Serum	135-5	
			λ	Serum	153.2	144.0
Owen and D	1947	30	λ	Serum	3.6-6.2	4.52
			N	Serum	140-159	153
			K	Serum	3.6-7.2	5.1
			N	U	35-167	96
Smith and Mason	1950	70	K	U	2.7-19	5
			N	Serum	136-158	142
			K	Serum	3.61-4.85	4.06
Rasmussen	1953	300	Ca	Serum	N 8	
		100	Ca	U		
Ward and E	1953	100	Ca	U	3.0-10.0	5
Ward and Kuh	1953	200	Ca	Serum	4.2-5.1	4.8

NORMAL VALUES

The values of sodium, potassium, and calcium in the blood serum and urine of normal persons obtained by various investigators by flame photometry are summarized in table 1. The distribution curves for these electrolytes compare well with hypothetical normal curves.^{1, 13, 16} Comparisons with chemical methods indicate that sodium values are the same within the limits of experimental error by both methods. Lower potassium values, however, are obtained by flame photometric methods than by chemical analysis.³ In Riethmüller's¹³ recent series of 300 serum calcium determinations, all were normal by chemical analysis, but 12.7 percent were out of the normal range by flame photometry analysis (6.7 percent below and 6.0 percent above). A similar series of 100 urine calcium determinations showed a standard deviation of 31 percent as compared with the chemical acidimetric titration method. The author, however, presents no data to verify this high deviation and normal values are not included. These results conflict with other experimental evidence reported in this country.^{16, 17} Additional investigation on the interference of phosphates on urinary calcium determinations by flame photometry apparently is necessary.

SUMMARY

Flame photometry is becoming very useful in the clinical laboratory. The determination of sodium, potassium, and calcium on as little as 0.5 ml. of blood serum or urine can now be done on commercial flame photometers by the average laboratory technician with an accuracy applicable to routine clinical work.

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Three Groups of Obstetricians

Broadly peaking one may classify obstetricians into three groups according to attitude. Those in the first group rooted in the days when most deliveries took place at home are inclined to give time and attention beyond the patient's actual medical and surgical needs and to use individualized amounts of analgesia and anesthesia. Those in the second group delegate to their assistants many of the routine procedures without psychologic integration of reactions of either the patient or the delegates plus the use of notable amounts of analgesia and anesthesia during labor and delivery. This tends toward full amnesia for many hours including prolonged anesthesia for delivery. Obstetricians in the third group devote calculated attention to a woman's psychologic need, educating her and enlisting her interest and active participation in her pregnancy and labor. Analgesia and anesthesia are used moderately and intelligently according to the individual needs and desires of the patient and calculated attention and moral support are forthcoming when they are needed.

—HAROLD B. DAVIDSON, M.D.

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p 106 J 1954

PSEUDOEPITHELIOMATOUS HYPERPLASIA ASSOCIATED WITH MYOBLASTOMA

A Diagnostic Pitfall

MARTIN A SWERDLOW *Captain MC USA*

LORENZO R BERRY *Major MC USA*

A L EDWARDS *First Lieutenant MC USA*

THE epithelial or epidermal hyperplasia commonly overlying a myoblastoma may be mistaken for squamous cell carcinoma¹⁻⁵ Our attention was directed to this unfortunate diagnostic error because of seven specimens of myoblastomas received by this laboratory in the past few months, two had been diagnosed as squamous cell carcinomas

CASE REPORTS

Case 1 A 38 year old woman had a slowly enlarging posterior cricoid lesion that had been present for about six weeks A biopsy was done and histologically the lesion had been interpreted as being squamous cell carcinoma On examination at this laboratory, the biopsied specimen showed thick epithelium with irregular downgrowths into the underlying nodular mass of cells Within some of these epithelial downgrowths were keratinized pearls The subepithelial cellular infiltrate extended up to the epithelium and in some fields surrounded the irregular epithelial downward extensions These subepithelial cells were predominantly large polyhedral cells with coarsely granular eosinophilic cytoplasm The nuclei were round, vesicular, and some contained a single nucleolus The nuclei of the cells in most fields were eccentric, in many fields no nuclei were discernible, and in occasional fields the cells contained multiple nuclei, usually two In addition, an occasional field contained cells with syncytial cytoplasmic masses and multiple nuclei This lesion was interpreted as representing a myoblastoma of the larynx, with overlying squamous hyperplasia (fig 1)

Case 2 A 23 year-old man complained of a tender indurated mass 1.5 cm in diameter, of the buttocks, which interfered with

sitting. The patient related the lesion, which was excised to a scorpion bite. After histologic examination the diagnosis of squamous cell carcinoma had been considered. On examination at this laboratory however the specimen showed a thickened

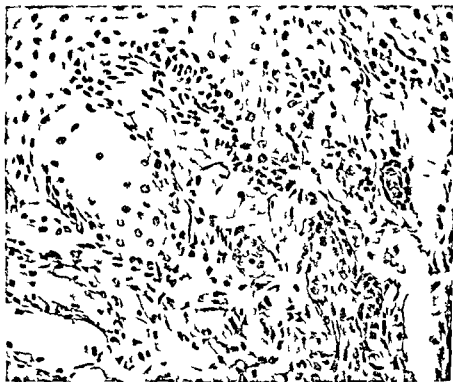


Fig. 1 (as 1) Section of epithelial hyperplasia showing the underlying myxoid tissue. ($\times 450$)

epidermis covering a dense cellular dermal infiltrate which consisted of small and larger polyhedral cells similar to those in case 1. The epidermis extended down irregularly into the cellular infiltrate and in places formed keratin pearls (fig 2)

DISCUSSION

The diagnosis of squamous cell carcinoma in these two lesions was erroneously made because of the striking and prominent overlying epithelial and epidermal hyperplasia. The features differentiating the overlying hyperplasia from squamous cell carcinoma are the intactness of the basement membranes about the epithelial downgrowth, the well differentiated squamous cells with few atypical cells, relatively few mitoses, little dyskeratosis, and the absence of features usually seen in carcinoma such as hyperchromasia and individual cell keratinization. The

differentiation may at times be difficult and it is helpful to be aware of the underlying myoblastoma



Figure 2 (case 2) Epithelial hyperplasia and the underlying myoblastoma. ($\times 100$)

The "myoblastoma" cells also vaguely resemble xanthomas because of the resemblance of the plump polygonal myoblast cells to xanthoma cells.^{2,6} Myoblastoma cells, however, do not stain with ordinary fat stains.

SUMMARY

Myoblastomas may be mistakenly diagnosed histologically as squamous cell carcinomas. This error is made primarily because of the prominent overlying epithelial or epidermal hyperplasia and to a lesser extent, the vague resemblance of the so called "myoblastoma" cells to squamous epithelial cells. These cases are presented to re-emphasize this serious pitfall in diagnosis and so to prevent unnecessary extensive surgical procedures.

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Centennial of Paul Ehrlich

In 1905 the discovery of the m crobe causing syphilis wa annou ced. This event was of great importance n m dicine. The Kit sato Institute f r Infect ous Dise se wa founded in Tokyo on his return to J pan by Kitas to friend of Ehrlich s since the time of their studi s at the labo atory of Robert Koch in Berlin. And now after the discove y of the syph lis spirochete o e of th most talented of Pr fes or Kitasato s pupils Dr Hata started at onc with experiment to produce syphilis in rabbits by inoculat on gaining gre t skill in h s work. In the sp ing of 1909 Dr Hata was s nt to Ehrlich to continue work on these lines at the Spey r H us producing infections in rabbits experimentally and then testing on these infected animals the curative propertie of the prepar tions worked out by Ehrlich. Dr Hata wa delighted to do th s work took all the small bottles Ehrli ch gave him w th inscriptions on the labels and said proudly with a nod 418 606. Dr H ta after his first t als of all the substances giv n to him soon came to show Ehrli ch his records and said Believe 606 very efficacious. Ehrli ch would not believe it and Hata unt ring dd not shrk repeating the experiments again and again u til clear and definite result was b tained that 606 was best. Ehrlich then confessed that h alw ys had had a strong feel g—yes had been convinced for two year —that 606 must be good. Trial treatments of patients had now to be made aga n by those collab at s who had already been work ng with 418 succe ssfully and f nally Ehrlich c nsented to announce the n ention of 606 to the w rld following a number of public tions showing good results.

—MARTHA MARQUARDT S tary t

P l Eh l ch 1902 15

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A NEW BURIED MOVABLE ORBITAL IMPLANT

JOHN H KING Jr *Colonel MC USA*

THE advantages of placing an implant in the orbit following the removal of the eyeball have been well established. During the past decade many implants have been devised in an effort to impart greater motility to the prosthetic eye.

The exposed or partly buried movable implant, which communicates directly with the prosthesis, gives superior mobility to the artificial eye and results in an excellent cosmetic appearance. These implants however have not withstood the test of time. They are not advised for military use because they eventually all extrude spontaneously or must be removed because of chronic infection.

The buried or completely covered movable implant does not connect directly with the prosthesis, but transmits movement to the artificial eye by causing motility of the socket in which the prosthesis is placed. The motion is not as good as with the exposed type, but the socket rarely becomes infected and extrusion is unusual. This type is preferred for use in military patients following enucleation of an eye when the orbit is free of infection.

There are advantages and disadvantages in the use of various types of buried movable implants. Those which are partly covered by a wire mesh of tantalum or stainless steel are preferable, because they impart good motion and do not tend to migrate within the orbit.

Sixty seven of the implants described in this report, a modification of that of Allen and Allen,¹ have been used during the past two years without the occurrence of rotation or extrusion. It is a muscle-tunnel type of methyl methacrylate with the anterior surface covered by stainless steel wire mesh (No 316), 50 by 50 strands per square inch, of 0.003 inch thickness, held in place by a stainless steel wire ring 0.025 inch in diameter. Tantalum mesh and wire were originally used to cover the implant, but stainless steel is less apt to fragment. Two sizes

were made. The larger, for adults, measures 18 mm in diameter and 12 mm in depth in the center with smooth rounded sides. The smaller size for children and secondary implants measures 15 mm on the face and 12 mm in depth. Four tunnels, equally spaced through the sides of the plastic, are brought together in the open faced front under the wire mesh (fig 1).

TECHNIC OF INSERTION

A circumcorneal incision is made through the conjunctiva by means of a blunt curved canaliculus knife or small sharp pointed scissors. Tenon's capsule is separated from the sclera as far

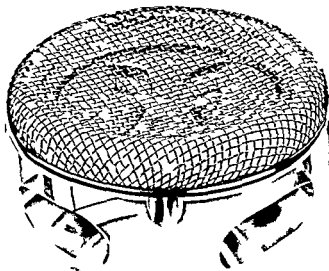


Fig 1 The m e t a l t y p e o f o r b i t a l i m p l a n t

back as possible by blunt curved scissors and the four rectus muscles are isolated in their sheaths well back 10 to 15 mm. Separate No. 0000 plain or mild chromic double armed catgut sutures are secured in each muscle at its insertion. The muscles are then sectioned from the globe and the sutures are clamped to the drapes maintaining their relative positions. The oblique muscles are cut and allowed to retract (fig 2A).

The eyeball is freed of its attachments by enucleation scissors as far back as the optic nerve which is sectioned. Previously placed scleral traction sutures or a Well's spoon placed behind the globe will insure a long nerve stump when this is desired. Complete hemostasis is obtained by placing hot gauze packs in the socket and maintaining firm pressure. Each double armed suture in a rectus muscle is then taken through a tunnel in the

implant and the needles are brought through the covering mesh as near the center as possible (fig 2B) The sutures are tied over the mesh and the lateral and medial ones are cut This fixes the implant and prevents rotation (fig 2C)

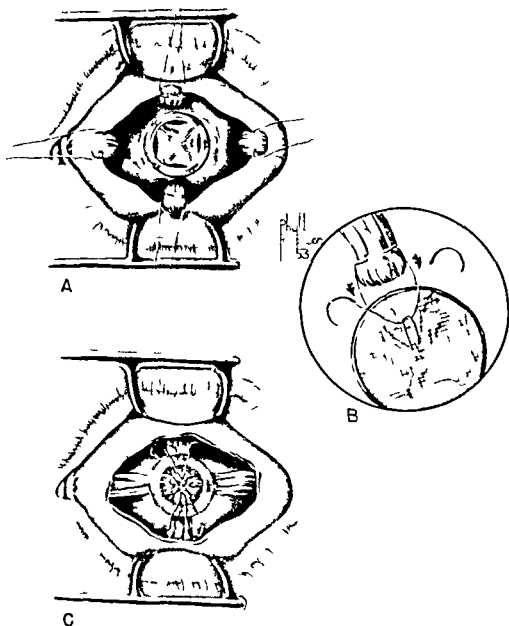


Figure 2 (A) The orbit showing the four rectus muscles held in their relative position by sutures and the implant set in place (B) The suture from a rectus muscle is passed through one of the tunnels and brought up through the mesh near the center of the implant (C) The orbit showing the sutures tied separately over the mesh of the implant Those from the medial and lateral rectus muscles have been cut

and in the penicillin treated group 27.7 hours. After the institution of treatment the mean duration of fever prior to a sustained drop in temperature to 99° F or lower was 46.5 hours in the erythromycin treated group and 47.5 hours in the penicillin treated group. The mean total duration of fever in the erythromycin-treated group was 74.4 hours and in the penicillin treated group 74.2 hours. The percentage of each group reaching a sustained drop in temperature to 99° F or lower at any given time during the study is shown in figure 2. This demonstrates no significant difference in the erythromycin treated group and in the penicillin treated group. In both groups the temperature of over 75 percent of the patients returned to normal within 48 hours.

CONCLUSIONS

The results of a controlled study of type A prime influenza show no difference in duration of illness between a group of 46 patients treated with erythromycin and a group of 40 patients who received procaine penicillin. The course of illness in the patients did not appear to be influenced by erythromycin. The drug was well tolerated by all patients receiving it. Mild gastrointestinal symptoms of anorexia and minimal diarrhea occurred in a few persons but were not severe enough to necessitate withdrawal of the drug. There were no manifest bacterial complications in either the erythromycin treated or the penicillin treated groups.

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The True Physician

No physician can afford to be without extensive scientific knowledge and skill but many physicians who lay their wreaths on the pedestal of pure science are surprised to find sooner or later that their idol is a false one. The patient comes to his physician to be comforted and the scientific treatment of disease is but one phase of that comfort. The true physician will ease his patient's pain give sympathetic understanding to his emotional turmoil and classify and treat his disease with as simple and direct means as may exist.

THE INCIDENCE OF ANTIBIOTIC RESISTANT STAPHYLOCOCCI IN NONGONOCOCCAL URETHRITIS

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IN recent years increasing numbers of staphylococci have become resistant to antibiotics.^{1,2} Seventy five staphylococci from low grade skin infections are resistant to penicillin, and 25 percent to aureomycin.^{3,4} Wilson and Croft⁵ reported a high incidence of similarly resistant cocci to be present in the nasopharynxes of healthy persons living with hospital or clinic patients. In the population the nasopharyngeal carrier rate is low. Whatever the mechanism is by which resistance develops, it is generally accepted that it develops with exposure of the bacteria to the antibiotic.

Nongonococcal urethritis, which constitutes a major problem to the armed services, is a low grade infection of the urethra and prostate gland occurring in young men who are sexually active and have usually taken penicillin orally for treatment of gonorrhea. Treatment of this disease with penicillin is satisfactory, but aureomycin has been found to be effective against staphylococcus is the organism most frequently found in the urethral exudate.^{7,8} Because of the effectiveness of treatment of these patients with penicillin, it is expected that the staphylococci found to be resistant to penicillin are the result of exposure to penicillin. To determine if this is true, every patient coming to the clinic with a purulent urethral discharge not due to gonorrhea was examined bacteriologically. This study was done at the Naval Medical Center, in the Far East during the four months of September and December of 1953.

METHOD

Smears of the urethral exudate were stained with Gram stain. Cultures were obtained from the urethra in the following manner. The meatus and glans were cleaned with 70% alcohol. The anterior urethra was stripped down to expose the mucosa. A drop or loopful of the expressed material was placed on a slide.

nutrient agar slant and incubated. When no urethral material could be obtained the prostate was massaged and the second or third drop of the purulent material obtained was used for culture. If less than three or four colonies grew and no organisms were seen on smear, the result was considered negative.

No cultures were done for gonococci. Gonorrhea was presumed to be ruled out in each case by the clinical picture and by a negative smear for gram negative intracellular diplococci.

All staphylococci found by culture were tested by the filter paper disk method for sensitivity to penicillin and to aureomycin.

RESULTS

Table 1 summarizes the pretreatment data on the 55 patients studied. On clinical grounds patients were considered to have an "acute" or a "chronic" condition depending on the duration of the symptoms. Those in the acute group were classified as non-gonococcal urethritis patients in the health record and were by far the more frequent of the two. These patients gave a history of a urethral discharge of but one or two days duration, no past history of the disease, and a fairly clear-cut history of sexual exposure usually two weeks before the onset of symptoms. Every patient had used penicillin orally as a prophylaxis. The chronic group composed of chronic prostatitis patients complained of intermittent and more varied symptoms, often without any demonstrable urethral discharge. These patients usually had a history of previous treatment for nongonococcal urethritis within the past two or three months.

TABLE 1. Results of treatment of patients with urethritis.

Group	Number of	Positive for phyloc	Staphylococcus	Staphylococcus
			peil	urmy
Acute	27	15 (56%)	12 (80%)	3 (20%)
Chronic	28	9 (32%)	7 (78%)	4 (44%)
Total	55	24 (44%)	19 (79%)	7 (29%)

Micrococcus pyogenes var. *aureus* was the organism identified from two of the 24 patients with positive cultures, and *Micrococcus pyogenes* var. *albus* was found to be present in 22. A higher percentage of the acute group than of the chronic group had these organisms in the urethral exudate, but the difference is of no significance statistically. Only one strain was sensitive to penicillin and resistant to aureomycin; five were sensitive to both, and the remainder were equally divided between those re-

sistant to both and those resistant to penicillin and sensitive to aureomycin

Aureomycin was used to treat all but two of the patients in this series. Fifteen follow up prostatic cultures were made from acute patients. An aureomycin sensitive organism either disappeared following treatment or changed to a resistant one. In no instance did an aureomycin sensitive organism remain after treatment with that drug. The only patient in the series treated with penicillin showed before treatment a staphylococcus that was sensitive to both antibiotics, and after treatment a staphylococcus resistant to penicillin but still sensitive to aureomycin.

DISCUSSION

This study confirms the prevalence of staphylococci in non gonococcal urethral exudates, secondly, the data on sensitivity coincide closely with similar data available in the literature regarding the high rate of resistance in staphylococci to those antibiotics in widespread use. Lastly, follow up cultures and sensitivity tests suggest that organisms develop resistance to an antibiotic drug during treatment with that drug. The impression was gained that treatment is most effective when instituted early and when the organism is one sensitive to the drug used.

In a few cases nonpathogenic bacteria other than staphylococcus were cultured, but these were not included in this study because of additional difficulty in identifying and testing them. By more thorough methods of taking specimens it is believed that a greater number of positive cultures would have been found. In all the patients with positive cultures in this series, however, the organisms were present in abundance.

If we can attribute the cause of nongonococcal urethritis to these rather nonvirulent organisms (no other specific causative agent having been discovered as yet), and if we assume that penicillin is a contributing factor, what might be the mechanism by which the infection begins? Penicillin by mouth could upset the bacterial equilibrium in such a way as to allow resistant organisms to prevail in the body and enter the lower urinary tract. This entrance might take place from the outside through the urethra, as in gonorrhea, or bacteria could come from the wall of the colon or rectum by direct spread, or from a distant focus by way of the blood stream. If the access is internal, the intestinal tract seems the most likely source. Recently, cases of a staphylococcal enteritis following penicillin therapy have been reported.^{10, 11} Garrod has shown that, *in vitro*, penicillin in low concentrations actually stimulates the growth of staphylococci and some other bacteria.¹²

SUMMARY

In a study of nongonococcal urethritis in 55 men on duty with the Navy in the Far East staphylococci were found in 44 percent of the patients. The organism was resistant to penicillin in 79 percent of the patients and to aureomycin in 29 percent. The previous oral administration of penicillin as a venereal prophylaxis in the great majority of these patients is suggested as a factor favoring the growth of the staphylococci.

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The Complex Human Organism

Psychiatry might be defined as that specialty of medicine that deals with the incongruous. The psychiatrist attempts to alleviate the suffering resulting from disparities between a person's emotional needs and the characteristic way in which he tries to satisfy those needs. Until the advent of dynamic psychiatry the incongruous behavior of the mentally ill was usually considered to be inextricably bound to mysticism. Without doubt the greatest advance in psychiatry within the last 100 years has been the discovery that the riddles of even the most bizarre and abnormal behavior can be understood in terms of the complex functioning of the human organism.

—BERNARD H. HALL, M.D.

J m l f th Am n M d al A t p 615 O 1953

MEDICAL RESEARCH IN THE DEPARTMENT OF DEFENSE

LOWELL T COGGESHALL M. D

Chairman Advisory Panel on Medical Sciences

Department of Defense

FROM the beginnings of the Department of Defense, the Secretary of Defense and his principal materiel agencies, the Munitions Board and the Research and Development Board, were generally conceived as co-ordinative bodies. While the Research and Development Board accomplished many useful things, it failed to achieve many of the important results that had been predicted by the more enthusiastic advocates of unification. It did represent a definite step in the evolution of the management of research and development by the Department of Defense. Its proper evaluation will come only after we gain better perspective with the passage of time.

The plan approved by Congress in June 1953 for the reorganization of the Department of Defense abolished the Research and Development Board by vesting its statutory functions in the Secretary of Defense. It clarified the responsibility of the Secretary of Defense with respect to the management of the military departments. It also provided for the appointment of six Assistant Secretaries of Defense without specifying their precise duties, but granted to the Secretary of Defense the authority for so doing.

The Assistant Secretaries were appointed in accordance with the recommendations contained in the Rockefeller Report. This report, while providing for an Assistant Secretary of Defense for Research and Development, is not very specific in its remarks pertaining to research and development. In recommending the dissolution of the Research and Development Board, it cautions that the Secretary of Defense "should not sacrifice such parts of the present functions of the Research and Development Board as are now operating satisfactorily." The report does set forth a philosophy for the operation of the Office of the Secretary of Defense and it is therefore usable as broad guidance for the Assistant Secretary for Research and Development.

The existing momentum of the three armed services in research and development had to be maintained. Rather than wholesale reorganization from the laboratory level upward, assistance

and guidance to the three departments in their research and development operations was continued Without in any way denying the ultimate responsibility and authority of the Secretary of Defense there had to be a large degree of decentralization

The responsibility of the armed services for research and development operations is recognized This responsibility is a fundamental and inseparable phase of their over all responsibility to provide themselves with proper weapons The three military departments are considered to be individually responsible for planning and executing sound departmental research and development programs The departments are to be responsible not only for determining that their programs are realistic in relation to the state of the art and the promise of success and sound in relation to the military needs, but also for ensuring that their programs are sound in relation to those of the other military departments Among those things considered to be primarily service responsibilities are inter service action to provide for meaningful preproject co-ordination to effect the easy transfer of technical information among service laboratories and their contractors and to enter into joint research and development operations to reduce duplication to promote efficiency and to achieve economy

The Assistant Secretary of Defense (Research and Development) reviews the departmental programs to determine that they are well co-ordinated and that collectively they constitute a sound and integrated over all Department of Defense program He has the responsibility for developing policies and establishing procedures to ensure the effective conduct of research and development operations by the military departments The policies must provide for sound research and development objectives for plans based on these objectives and for budgets facilities and organizations to implement the plans The Assistant Secretary (Research and Development) must see that all these things come to pass not only by his own actions in policy preparation but also by review of the service operations and by providing the leadership and guidance for those operations

To facilitate co-ordination and to assist in the review of the research and development operations by the Secretary of Defense in service co-ordinating committees for the dozen or so major research and development technical areas were organized One of these co-ordinating committees is in the field of medical sciences Others in fields closely related to medical sciences are personnel and training general sciences atomic energy and biological and chemical warfare Each committee has a permanent staff of an executive secretary and certain designated

assistants The chairmanship of the co-ordinating committees is vested in the three authorized deputy Assistant Secretaries of Defense (Research and Development)

COORDINATING COMMITTEE ON MEDICAL SCIENCES

The Coordinating Committee on Medical Sciences was officially established by Department of Defense Directive on 6 January 1954 It is provided as "a staff mechanism for achieving a sound, coordinated, and integrated research and development program in the field of medical sciences" The field of interest of the Committee includes aviation medicine, shipboard and submarine medicine, physiology, military and field medicine, psychiatry, atomic medicine, and other pertinent allied medical sciences Committee membership includes the senior medical research representatives of the Army, Navy, and Air Force Also included in its membership are the senior representatives of the Assistant Chief of Staff, G 4 Logistics, Department of the Army; the Office of Naval Research, the Director of Research and Development Deputy Chief of Staff, Development, Department of the Air Force and the senior military member of the staff of the Assistant Secretary of Defense (Health and Medical)

The Committee currently meets regularly once a month It reviews plans and programs for (1) adequacy and proper balance, (2) interchange of research and development information among the departments (3) specific agreements involving joint activities to achieve integration, (4) approval of major projects and important changes in direction or scope of such projects prior to initiation to ensure economy, and (5) advice to the Assistant Secretary of Defense (Research and Development) on needs for funding of research and development activities and facilities In areas of common interest to more than one committee, the chairman of the committees concerned may arrange for joint collaboration

It is planned that the Coordinating Committee will regularly receive advice and guidance from the Advisory Panel on Medical Sciences appointed by the Assistant Secretary of Defense (Research and Development) and may request advice from any advisory panel through the panel chairman Departmental members of the Committee may also make such requests on behalf of their departments The mode of collaboration between the Coordinating Committee and the Advisory Panel will be delineated by the Assistant Secretary of Defense (Research and Development) and implemented by the chairmen

ADVISORY PANEL ON MEDICAL SCIENCES

The Advisory Panel on Medical Sciences was chartered in a Department of Defense Directive dated 14 January 1954 to ensure that the Nation's best scientific and technical talents are applied to the planning and prosecution of the military research and development programs on medical sciences. The directive states: This Panel shall consist of members designated by the Assistant Secretary of Defense (Research and Development) from among civilian scientists and experts. The number, selection and terms of Panel members shall be such as, in the judgment of the Assistant Secretary of Defense (Research and Development), are required to achieve this purpose efficiently. The Assistant Secretary of Defense (Research and Development) has designated the Chairman of the abolished Committee on Medical Sciences Research and Development Board as the first chairman of the Advisory Panel on Medical Sciences.

The chairman has nominated and the Assistant Secretary of Defense (Research and Development) has appointed a small group of consultants to be the steering group for the new organization. The new Advisory Panel will bring together many specialties not included by the former Committee on Medical Sciences Research and Development Board. It is anticipated that nominees of the National Research Council and the Armed Forces Epidemiology Board will be among those recommended to be consultants to the Assistant Secretary of Defense (Research and Development). Where subject matter is judged to be of sufficient interest to other agencies of the Federal Government, the Assistant Secretary of Defense (Research and Development) may designate as associate members qualified representatives formally nominated by the heads of such agencies.

The procedures for obtaining the advice and assistance of the Panel members will be as flexible as is consistent with the purpose for which the Panel was designed. The Panel chairman will work with the Assistant Secretary of Defense (Research and Development) and with the chairmen of related co-ordinating committees in the selection of groups of panel members to review and advise on important problems in their fields of competence. He will also assist in bringing this advice to the appropriate co-ordinating committee for consideration.

The Advisory Panel will study the military research and development programs within its field of interest in order to advise the co-ordinating committees. It will also report its findings and conclusions to the Assistant Secretary of Defense (Research and Development) and in particular will note its indorsement of or its disagreement with the programs studied. In their studies the Advisory Panel members will consider the broad features

of the program with particular reference to adequacy, timing, and technical balance in the light of military needs and the state of the art, with emphasis on important areas and problems rather than on detailed review of the entire field

The Advisory Panel members will be available for the purpose of giving advice in special areas of interest to a single military department. Requests for such studies will be addressed to the Panel chairman through the departmental member of the Coordinating Committee on Medical Sciences.

Participation of Panel members on joint or ad hoc interarea panels will be arranged by the Assistant Secretary of Defense (Research and Development) or by the Panel chairman with the approval of the Assistant Secretary of Defense (Research and Development).

The Advisory Panel is provided with a secretary to assist the chairman and other members of the Panel in their work. He is responsible for keeping the Panel members informed on the military research and development programs of the extent necessary for their assigned tasks.

The executive secretary of the Coordinating Committee and the secretary of the Advisory Panel are titles vested in one person who is a doctor of medicine. He has an administrative assistant. Thus in one office, with one set of files, information is available to both Committee and Panel members.

Interdepartmental co-ordination in medical sciences has existed on an informal basis for several years through regular monthly meetings of the medical research heads of the Army, Navy, and Air Force. At these informal meetings preproject co-ordination functions are achieved and problems of mutual interest to the three services discussed but no minutes are kept. This group is currently proving its effectiveness by pre-co-ordination of the meetings of the Coordinating Committee on Medical Sciences.

There are now two Assistant Secretaries of Defense interested in the field of medicine. The Assistant Secretary of Defense (Health and Medical) has cognizance of all medical matters except research and development, and the Assistant Secretary of Defense (Research and Development) over all research and development including medical research and development. The reason for including medical research under the Assistant Secretary of Defense (Research and Development) is necessitated by governmental organization wherein the budget for all research and development comes under his jurisdiction, and medical research is included in this budget. It is important for those responsible for medical research to have adequate representation

when budgetary determinations are made to ensure that a proper amount is allotted to medical sciences even though it be small in comparison to the total given to the field of military research. Because it is fitting and proper that medical representatives should be present to assist and advise the Assistant Secretary of Defense (Research and Development), co-ordination is necessary between the Assistant Secretary of Defense (Health and Medical) and Assistant Secretary of Defense (Research and Development).

On 15 March 1954 the steering group of the Advisory Panel on Medical Sciences to the Assistant Secretary of Defense (Research and Development) held its first meeting. This meeting was held jointly with the Advisory Council to the Assistant Secretary of Defense (Health and Medical). With such a promising beginning it appears certain that co-ordination will be continued among the civilians as well as it has been accomplished in the past and currently is in effect among the staff representatives of the two Assistant Secretaries and the Coordinating Committee on Medical Sciences.

The new organization is now operating only the test of time will prove or disprove its worth. Indications are that it is a vast improvement over the former Research and Development Board because a long chain of command and many months were required to effect a recommendation. Progress has been made now decisions can be made and actions initiated almost simultaneously.

Prevention of Suicide

If an hour ago someone in the United States committed suicide. Another has done so as these words are read the average is a suicide every 30 minutes. These two persons are dead and no further follow up can help them. They have failed society and society has failed them. But in the same half hour another 20 persons have attempted suicide. Now their stomachs are being emptied, wounds are being repaired, bullets extracted. These patients will be dismissed in the hope that they will never return. Some however will attempt suicide again and fail again, others will be among the yearly 22 000 persons who kill themselves in the United States. That number incidentally is almost exactly the number of American soldiers killed in Korea in three years of war. It behooves physicians both professionally and as citizens to learn how to help persons who might commit suicide.

—HERBERT BAUER M D

Californ M d p 424 D 1953

GROUP THERAPY IN A MILITARY HOSPITAL

ROBERT D TOWNE *First Lieutenant USAF (MC)*

INCREASING numbers of reports dealing with the application of group therapy technics to the treatment of hospitalized and ambulatory psychiatric patients have received prominent notice in recent medical literature. These technics vary from group participation in musical recreation and occupational therapy to psychodrama and psychoanalytically oriented group psychotherapy.

Loosely defined, group therapy has come to mean the treatment of two or more patients by one or more therapists using psychologic methods. It attempts to encourage the development of meaningful interpersonal relationships between individual members of the group as well as between patient and therapist, thereby resulting in considerable economy of time and effort. These economies are of the utmost importance in the military service. Recent wartime experience has demonstrated that the numbers of patients needing some sort of psychiatric treatment and disposition place a constant strain on available trained personnel. The threat of a major catastrophe further forewarns that some efforts need be made to cope with the large numbers of psychiatric as well as general medical casualties that may be anticipated. Present conditions indicate that even in peacetime the load of psychiatric patients drawn from the armed services frequently creates a considerable backlog awaiting professional attention. There is some indication that the extensive use of group therapy programs may not only increase the turnover rate for patients receiving treatment, but will add a therapeutic technic that seems well adapted to the more limited goals of military psychiatry.

NEED FOR GROUP THERAPY

The psychiatrist in the military setting finds general emphasis placed on the diagnosis and disposition of the patient, the governing principle being to determine whether or not he is able to perform further military duty. Attempts at treatment are necessarily made on a short term basis. The patients are either returned to active duty or separated from the service after a comparatively short hospitalization, as administrative procedures necessary in carrying out these plans leave insufficient time for individual treatment.

The neuropsychiatric centers in the armed forces apply the standard somatic therapies, and efforts are made to furnish occupational and recreational activities for groups of patients. In attempting to create this therapeutic milieu for the hospitalized patient, however, some difficulties arise. Ward personnel both professional and lay, respond to the general therapeutic de-
sis by devoting their time to keeping the wards clean and the patients from becoming troublesome. The psychiatrist's limited participation in therapy reinforces this reaction. Because the medical officer does not seem to be doing much in the way of treatment, the ancillary personnel may come to regard them else as custodians or guards. Sympathetic concern for the patient's illness and suffering is poorly developed and because the psychiatric wards often seem to function as a haven for the readjusted persons, the compensatory gains the patient extracts from his hospitalization arouse the staff's resentment. The personnel restricting themselves to menial duties develop hostility toward the patient because of his escape from the rigors of military duty, morale on the neuropsychiatric service tends to decline. These feelings are rapidly communicated to all the patients, who respond with further hostility, passive defiance or withdrawal. Once established, this circular interaction tends to perpetuate itself, and the probability of establishing a therapeutic atmosphere becomes more and more remote.

ADVANTAGES OF GROUP THERAPY

In the introduction of group therapy it is clearly established that its purpose is to *treat* the patient. The ward physician by sitting in group meetings with the patients lends concrete action to support his therapeutic philosophy and attitude. In the hospital the personnel on the ward are encouraged to attend the group sessions. For the most part they have been silent participants but in several instances they have become members of a group for varying periods of time. The nurses and medical aides who observe or participate in group meetings gradually become willing to accept the reality of the patient's mental illness and his need for sympathetic understanding. Resentment in the ward staff growing out of the patient's absence from duty is replaced by a more active participation in finding a solution for his problems. Once established on the hospital ward, the group therapy program can continue to function as a guide for the desired therapeutic attitude on the part of the staff and to serve as a method whereby the psychiatrist can actively participate in an attempt to establish corrective interpersonal relationships in the patient's under his care.

DEVELOPMENT OF GROUP PROCESS

The inauguration of a group therapy program in the neuropsychiatric service of this hospital has provided an opportunity for studying the development of the group process as well as for observing the effect of such a program on ward physicians and personnel. The psychiatric service was made up of two open wards (33 beds each) two closed wards (25 beds each) and an outpatient department. The patient population consisted of a rapidly fluctuating number of men with neurotic, psychotic, and psychopathic disorders. For the most part, the routine diagnosis and treatment of the patients functioned smoothly. Moderately active occupational and recreational therapy programs were in progress, and electroconvulsive therapy was available for selected patients. Initially, the ward psychiatrist saw each newly admitted patient individually for the purpose of establishing a tentative diagnosis and planning his disposition. In addition, some patients were seen individually within the limited time available to the ward officer. Once the diagnosis was established, most patients would continue as ward members, participating to a varying extent in the occupational and recreational programs while awaiting return to duty or separation from military service.

Group therapy sessions were instituted on all the wards and in the outpatient department, the details being determined by the individual ward physician. As the program stabilized, groups of four to eight patients met regularly with their therapist for about 40 minutes one to three times per week. The frequency of meetings had been predetermined for the most part on the basis of the time available and the goals sought.

ATTITUDES TOWARD GROUP THERAPY

Initial group meetings on all the wards were characterized by a similar "testing period." The patients attempted to find out if the doctor meant what he said, that "we can talk about anything here." As a commissioned officer the psychiatrist was an authoritarian figure with real as well as fantasied powers. The airman-patient officer-psychiatrist relationship presented many new and difficult problems. The enlisted man brought with him to the doctor-patient relationship the conditioned need for approval from a military superior. Military society often imposed this need on an unwilling recruit who had already demonstrated significant conflicts with authority figures, and this need for approval often led the patient to suppress and disguise disturbing emotional problems that threatened his self-esteem and social equilibrium. This mechanism inhibited attempts to uncover the painful areas

of emotional involvement and resulted in the initiation of efforts directed toward effecting a change in the environment. Most of the staff psychiatrists, having been trained in the techniques of more permissive psychodynamic psychotherapy, found the authoritarian role uncomfortable and unwieldy. Feeling that the authoritarian aspects of the relationship suppressed important material, distorted communication, and forced the physician into a particular and undesirable role, the group therapist attempted to create a permissive atmosphere. Thus, during the initial testing period, although there were long silences as the channel of communication broadened from the stereotyped military responses of the "yes sir and no sir" type questions directed to sound the therapist's views on military life and discipline were early forthcoming. There were experimental trials by some patients in expressing hostility or retreating into nonparticipation. One series of group meetings led by a psychologist who was a noncommissioned officer rapidly evolved into heated and bitter discussions which on one occasion came near to an open fight. At that time the speculation was entertained that the therapist's noncommissioned status had allowed for the development in this group of more uninhibited communication with less authoritarian conflict.

GROWTH OF PATIENT PARTICIPATION

In all groups the early tentative testing developed increased ventilation of complaints and criticisms which varied from dissatisfaction with the physical surroundings to resentment of inattention and inadequate symptomatic relief. Many of these complaints centered about the patient's job, his commanding officer, geographic location, or lack of promotion. After several weeks of such ventilation in a permissive setting the complaints became milder and some suggestions were offered by group members to increase further their comfort and treatment. Subject matter gradually evolved from bland to more emotionally laden material and some interest in common problems and their solution was periodically expressed. As the meetings progressed patients began to form loyalties. There were those who sided with the hospital and the *status quo* and those who were opposed. The therapist often found himself defended from attack by patients who seemed to function as assistant group leaders. Their contributions, evidently motivated by a desire to obtain the leader's approval and to reduce group tension, favorably stimulated group cohesion. This development of assistant leaders permitted a more passive participation by the therapist and encouraged the evolution toward a leaderless group. New patients who entered the group program with a desire to test the authoritarian system tended to receive support from the group members already integrated.

CLOSED WARD THERAPY

Observations made of the developing group process pointed up variations encountered in the open wards as compared with the closed wards. Many of the differences noted in the responses of the patients, as well as in those of the physician, were seemingly determined by the severity of the individual's illness and the psychiatrist's reaction to it. In general the closed wards contained the more severely ill patients, and an attempt made to have the psychotic patients on these wards meet in homogeneous groups revealed several advantages of this method. Because the psychotic patients required longer to form social relationships and were hospitalized for a greater period of time, formation of a group among them produced stabilization. In addition, the techniques employed with psychotic patients often differed from those used with neurotics and others.

Participation in closed ward group meetings was not always on a verbal level. The group atmosphere allowed for the silent participation of some of the more withdrawn patients. Many of these men, finding safety in numbers, seemed less threatened by the permissive group atmosphere. Group membership also helped to shorten the time needed for the re-establishment of social relations. This was especially rewarding in those instances where frequent interviews were impossible within the restricted framework of treatment. The group process seemed able, at times, to assist the more withdrawn, nonverbal members in their reawakened efforts at communication.

OPEN WARD THERAPY

The open ward groups presented somewhat different problems. For the most part these patients were not severely ill, many were suitable for outpatient management, but had been hospitalized due to a lack of facilities at their own air base.

A constant problem was the lack of motivation for improvement. The realistic gains of illness enabled patients to secure sympathetic hospital care and even escape from unpleasant duty. Often patients, through their strong need to avoid anxiety, compounded this difficulty by attempting, unconsciously as well as consciously, to manipulate the environment. Once hospitalized, many of these men became difficult to rehabilitate. Symptoms would rapidly recur when they were faced with return to duty, and their ability to give up some of their dependent gratifications decreased with time.

In this setting group therapy helped to break down the omnipresent barriers to communication. The permissive group approach encouraged the expression of feelings within the group meeting.

Within this microcosm the routine problems of ward administration such as the assignment of duties to each patient and the adherence to ward rules were introduced discussed with considerable feeling, and a group decision reached. Such a procedure frequently allowed the men to accept their roles as airmen patients in a military hospital more willingly and without arousing undue authoritarian conflict. In some instances the group meetings functioned as a screening process to determine which patients were motivated toward treatment.

OUTPATIENT THERAPY

The outpatient group program developed slowly and was formed with the intention that it would serve two principal ends: (1) to provide continuing treatment for ambulatory patients who needed supportive therapy and ventilation and (2) to act as a screening method to eliminate those patients appearing at the neuropsychiatric clinic who were not motivated toward treatment. It was hoped that the most suitable candidates for psychotherapy would be identified to receive individual attention. For a time the outpatient group was led by a psychiatrist; however, members of the psychology staff were gradually integrated into the program and later conducted the groups with minimal supervision.

For the most part no significant numbers of candidates suitable for individual treatment have been forthcoming from the outpatient group. This seemed to be a function both of the type of patient seen in the outpatient clinic and of the inefficient integration of the outpatient group therapy program into the neuropsychiatric service as a whole. There has been some success in assembling those patients desiring ventilation and support into a group, thus slightly reducing the demands for more individual attention. Patients who ventilate strong feelings about the military service and about their personal plight and who then find other men with the same difficulties seem able to derive some support from the realization that others have similar problems and seem benefited by the opportunity to discuss them in a permissive atmosphere. To the extent that this method tends to discourage the dependent relationship developed in individual therapy, it appears to be of particular value in military patients.

DISCUSSION

In a group therapy program in a military hospital membership of the group is constantly changing. This situation has its disadvantages because it inhibits the development of strong group identity feelings and acts as a limiting factor in determining the depth and magnitude of emotionally laden material brought forth for discussion. The transitional quality of life in the service is further

re enforced by its reflection in the fluctuating membership of the group

Paradoxically, the existence of a group program also seems to offer some elements of stability in a rapidly changing environment. The therapeutic attitude and continuing group treatment continues to function, incorporating new members among the patients and professional staff as the occasion demands. Assignment changes for the professional and subprofessional staffs exerts a considerable influence on any attempted treatment program. Any effort directed toward providing a medium for continuing therapeutic treatment seems worthwhile. Such a program should permit a smooth integration of all new personnel entering the ward setting. Selected psychologists, social workers, nurses, and medical technicians, by becoming capable leaders of patient groups, can relieve the professional staff of the burden of large numbers of patients awaiting treatment. Ancillary personnel may also receive valuable training by attending group meetings where they are able to observe the desired attitudes and technics as applied to patients.

The research possibilities of group therapy programs are receiving attention at present. Efforts are continually made to determine if the group process can serve as a model for other significant interpersonal relationships. In the military service considerable information may be gained by studying the psychology of military groups and their adjustment problems. Multiple therapists, or leader and observer teams, co-operating in group psychology research can assemble much meaningful and increasingly objective data.

SUMMARY

In a description of the development of a group therapy program on the neuropsychiatric service of a military hospital mention is made of the advantages afforded in terms of economy of time and effort, creation of a therapeutic atmosphere, and integration into a teaching and research program. The early development of the group process as observed in this setting as outlined demonstrates the authoritarian conflicts and other problems created by the transitional environment characteristic of a military setting.

*I had six honest serving men—They taught me all I knew. Their
names were Where and What and When—and Why and How and Who
—Rudyard Kipling*

A COMBAT ZONE NEUROPSYCHIATRIC TREATMENT CENTER

DAVID H WILSON M , MC USA

DURING the latter part of World War II, with the assignment of a psychiatrist to the staff of the division surgeon the principle of forward treatment of neuropsychiatric casualties was established. Because of the relatively mobile type of warfare involved and a high incidence of true combat exhaustion treatment centers were set up at corps level for those patients requiring more than a short period of recuperation. In the postwar organization of psychiatric care at army level, these centers were maintained on the basis of their success in the previous war.

The advent of a stable combat situation in Korea however radically changed this requirement for efficient handling of psychiatric casualties. Because combat stress was intermittent rather than prolonged true combat exhaustion constituted a much smaller portion of the patients treated by the division psychiatrist. The conditions seen were generally of a milder nature and the static position of the division enabled the psychiatrist to spend more time with each patient. As a result so few patients required extensive rear echelon treatment that to establish a treatment center at corps level would have been unnecessary.

Casualties in forward areas requiring further psychiatric care were sent directly to evacuation hospitals but the flaws in this system soon became apparent. Adequate rehabilitation regimen in the evacuation hospital was difficult to maintain because trained psychiatric personnel were scattered throughout the army area and one unit could be overburdened while another was not. Frequently casualties had to be sent hundreds of miles to the rear for bed space and one of the greatest disadvantages of this dispersion was the removal of the casualty from a military setting to a medical installation.

STRUCTURE OF THE CENTER

In the second year of the Korean conflict a psychiatric medical detachment was activated to function as the neuropsychiatric treatment center for the Eighth Army. The physical layout of the

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professional component of the center consisted of a clinic with offices for the professional and clerical staff, a dispensary, one closed ward, one restricted activities ward, one to four open wards (depending on patient load), an admission and disposition tent, and a training tent. The clinic and closed ward were housed in quonset huts, and the others in winterized tents. The capacity was about 120 beds, of which 20 were closed ward beds.

FUNCTION

The primary mission of the unit was the rapid treatment and rehabilitation of psychiatric casualties in a nonmedical environment. In order to accomplish this task the following were organized: the admission and disposition, inpatient, outpatient, psychiatric social work, clinical psychology, rehabilitation, and neurology sections, the closed and semiclosed wards and the dispensary.

Patients admitted to the hospital were immediately impressed with two ideas: first, they were to remain as soldiers in a military setting and were not to be considered disabled, and second, brief hospitalization was to prepare them for return to full duty. Regular duty uniforms were worn, the wards were identical to ordinary barracks, and reveille, mess, police details, and formations were conducted with emphasis on physical reconditioning, including calisthenics, hikes, drill, and supervised athletics. Recreation was limited, and passes were restricted to essential business. In the closed ward, however, patients wore pajamas and their meals were served to them. Patients on the semiclosed ward did not participate in the rehabilitation program because of their physical or neurologic conditions. A few were severely disabled neurotic patients not yet ready for the activities program.

RECORDS

Complete records were maintained on all patients. When a patient left the unit, copies of all pertinent data were filed and cross indexed, including final summary, data from the unit or previous medical records, and a mimeographed worksheet containing all significant administrative information. A copy of the final summary was sent not only to the referring physician, but also to the patient's unit commander, the unit surgeon, and, if the patient was evacuated or transferred, to the next medical facility.

THERAPY

Treatment, as a rule, was direct and practical. Group therapy was inadvisable as the average duration of hospitalization was too short to allow the development of any group identity. There

peutic adjuncts such as amobarbital sodium (amytal) thiopental sodium (pentothal), hypnosis, et cetera, were used sparingly and usually for diagnostic rather than therapeutic purposes. The patient's past history was used by the physician more to understand behavior patterns rather than to gain a "deep" or insight therapeutic approach.

RESULTS

During the first year of operation 2 204 patients were admitted to and discharged from the unit. Of this number 18.8 percent (414) were evacuated to Japan, 3.8 percent were transferred to other hospitals in Korea, 17.8 percent were returned to limited duty, and the remaining 59.6 percent were returned to full duty, for a total of 77.4 percent returned to duty. The inpatient census varied from 25 to 72 with an average daily census of 52.3. The average duration of hospitalization was six and one half days. Of all patients admitted 37.6 percent were from a combat area—"combat area" in this case being defined as "true combat in a 4 point zone that is no farther from the main line of resistance than the infantry battalion headquarters. The other 62.4 percent were from 2 and 3 point areas (regimental division, corps and army level). During the same year, 1 078 other patients were seen in consultation in the outpatient clinic.

TABLE 1 *Breakdown of patient*

Diagnosis	Patient
	per cent
Character disorders	46.5
Psychiatry	24.7
Psychoses	16.0
Neurology	10.8
Neurology	2.0

A breakdown of detailed diagnoses is beyond the scope of this article but a general concept of the types of patients treated can be gained from a categorical summary of diagnoses (table 1).

Included in the "no disease found" category are not only those patients in whom no disease was evident but also those with other medical or surgical diagnoses and others given clearance for administrative procedures. The 16 percent of patients with psychoses account for all but 2.8 percent of those who were evacuated.

OTHER FUNCTIONS OF THE UNIT

In addition to its primary mission, the center accomplished certain other services. All psychiatrists assigned to the Eighth Army and Korea Communication Zone were first stationed at this center, either on temporary duty en route to their organization or on a permanent assignment while awaiting a vacancy in a division or evacuation hospital. This uniform indoctrination in combat psychiatry standardized the general policy in handling psychiatric patients throughout Korea and established a close personal working relationship among the various installations. When the staff was at full strength, it provided a pool of trained personnel who could be called on in case of sudden need elsewhere.

Because of its centralized location, the unit was host at the periodic psychiatric meetings and was used to give training in the fundamentals of neuropsychiatry and the practical aspects of military psychiatry, not only to U S medical officers but also to those of the Republic of Korea Army. Groups of five Korean doctors were assigned to the center for a six month period of training. Members of the staff visited the local ROKA hospital and acted as consultants for their psychiatric service.

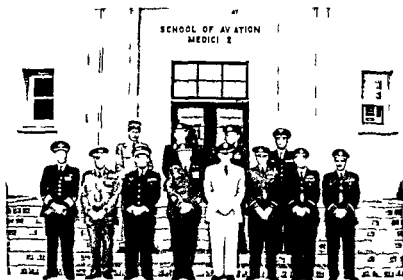
SUMMARY

The organization, in the Korean conflict, of psychiatric treatment in a combat area similar to that set up during World War II was found to be inadequate in coping with the new problems of a static situation. A psychiatric treatment center was established which, in its first year of operation, discharged about 2,200 inpatients, returning more than 75 percent to duty. During the same period about 1,100 outpatients were treated. Of the 3,300 patients treated, nearly half had character and behavior disorders. It is believed that this type of unit makes the most efficient use of trained professional manpower in the treatment of psychiatric casualties in a combat area.

The dental profession and other interested agencies have a responsibility to warn the public of the cariogenic property of sugars and their solutions and to point out that many of these products contain no highly important nutritional factors. Research should be encouraged on the part of producers of sweetened beverages and confections to support the development of new or improved procedures or agents for the prevention and control of dental caries which may result from the use of their products.

USAF SCHOOL OF AVIATION MEDICINE HOST TO SURGEONS GENERAL OF 12 AIR FORCES

Accompanied by Major General Harry G. Armstrong, Surgeon General U S Air Force, the chief medical officers of 11 foreign air forces recently visited the U S Air Force School of Aviation Medicine at Randolph Air Force Base, Tex., where they were the official guests for two days of the commandant, Brigadier General Edward J. Kendrick, USAF (MC).



The surgeons general of 12 air forces photographed Texas. From left to right: Col. Gustaf Severin, Sweden; Brig. Gen. Miguel L. Font, Spain; Maj. Gen. Perrin R. Labathe, France; Lt. Gen. Gennaro Pera, Italy; Maj. Gen. Harry G. Armstrong, United States; Air Marshal Sir James Kilpatrick, Great Britain; Air Vice Marshal E. A. Daly, Australia; Air Commodore A. A. G. Corbett, Canada; Brig. Gen. Klaus W. G. Swetland, Norway; Col. Olaf Nyby, Norway; Col. H. G. Smith, Denmark; Col. Duk S. G. Chab, Republic of Korea.

General Armstrong and his party, which included 19 high-ranking air force medical officers of other countries, departed from Washington, D. C., by military aircraft after attending the 25th anniversary meeting of the Aero Medical Association. The group also visited the Air Force Aero Medical Laboratory at Wright Patterson Air Force Base, Ohio, and the Gunter Branch of the School of Aviation Medicine at Gunter Air Force Base, Ala.

Iliac Horns

A Manifestation of Hereditary Osteo-onychodysplasia

JOHN C. BATES *Major MC USA*

IN 1946 Fong¹ presented a case demonstrating "symmetrical, bilateral, central, posterior iliac processes" which he called iliac horns. Doub,² in an editorial addendum, presented a roentgenogram demonstrating the same processes. These posterior iliac horns were not considered of particular significance except for their unusual appearance. Thompson and associates³ in 1949 presented four cases of posterior iliac horns, and proved they were associated with a recognized hereditary dysplasia. Turner described several cases of hereditary arthrodysplasia associated with hereditary dystrophy of the nails. He investigated two families in which 35 of 79 members were affected. With the aid of illustrations and roentgenograms he reported in detail the defects noted; however, he did not specifically describe the posterior iliac horns, although they can be seen by close examination of a reproduction of a roentgenogram in his article. Aschner⁴ discussed the genetics of these hereditary dysplasias, and concluded that defects of the nails, patellas, and radial heads constituted a typical hereditary syndrome. He apparently did not consider the pelvic findings of importance. The Firth family in England, observed by Lester,⁵ consisted of three generations totaling 16 persons of whom seven had a familial dyschondroplasia associated with anonychia and other deformities. Lester believed that deformities of the ilia (not posterior horns) and scapulas were part of the congenital hereditary syndrome and that a peculiar pigmentation of the iris might also be connected with the disease.

Montant and Eggermann⁶ discussed this hereditary syndrome, and called particular attention to the fair, blue eyed members of these families as being particularly susceptible to the defects. This point was not supported by other authors, and the patient presented here was brunette with dark brown eyes. Roeckerath⁷ in reporting on a series of cases believed that patients with hereditary osteo-onychodysplasia might present some or all of the following findings:

¹ From U S Army Hospital Fort Campbell Ky

1 *Dysplasias of the pelvic girdle* Iliac horns hypoplasia of the ilia, bowed sacrum with hyperlordosis of the lumbar spine bilateral protrusio acetabuli and coxa valga

2 *Dysplasias of the knee joints* Absence of or hypoplasia of the patellas hyperplasia of the internal condyle of the femur and hypoplasia of the fibular head with stunting of the tibiofibular joint

3 *Nail dysplasias* Thumb most constantly involved index finger next most commonly involved (Toenails appear to be spared)

4 *Anomalies of pigmentation of the iris* Lester's sign

5 *Dysplasias of the elbows* Hyperplasia of the ulnar epicondyle of the humerus hypoplasia of the capitellum and hypoplasia or agenesis of radial heads

6 *Foot dysplasias* Hypertrophy of the malleoli and club feet or flat feet



Fig 1 I t a v e p y l g r m d m t t g il b

7 *Arm and hand dysplasias* Madelung's deformity with dislocation of the lunate hypertrophy of the styloid process of ulna

hand may be more plump than usual with clinodactyly or camptodactyly, and sometimes hyperflexion of the fingers

8 *Shoulder girdle dysplasias* Hypoplasia of the scapula, tendency to dislocation and fracture of the clavicle, and flattening of the humeral head and bicipital sulcus

9 *Hyperostosis of the frontal bone*



Figure 2 Detail of anteroposterior view of single iliac bone.

He noted that the ribs and vertebrae did not appear to be involved, and that vertebral anomalies in these families were no more frequent than in the general population. A study of the reported cases and of my own patient indicate that certain characteristic defects* such as dysplasia of the thumb nails, abnormalities of the patellas, limitation of motion of the elbows, and posterior iliac horns are more apt to be consistently present.

CASE REPORT

A 25 year-old man entered the hospital complaining of low back pain. Because of albuminuria an intravenous pyelogram was done and posterior iliac horns were noted (figs 1 and 2). A complete bone survey showed (1) spondylolisthesis of the fifth lumbar vertebra (2) iliac horns located posteriorly (fig 3) (3) bilateral hypoplasia of the patellas (fig 4) (4) bilateral incomplete development of the semilunar notches at the elbows and partial subluxation of the radial heads (fig 5) (5) minimal hyperostosis frontal bone of skull and (6) old well healed fracture of the right clavicle. The bones of the shoulders wrists hands ankles feet and thoracic and cervical spines were normal.



Fig 3 Obl q ew b b d m t t the la horns ly g po ter only and the def t nth f/th l mb t b a.

The patient had marked bilateral hypoplasia of the thumb nails (fig 6) and longitudinal striation in the nails of the index fingers but was more pronounced on the right than on the left (fig 7). He had bilateral limitation of extension of the arms at the elbow joints. The patellas were small and located laterally when standing. The patient had pain in the back directly over the fifth lumbar vertebra with some limitation of motion. This patient a brunette with extremely dark coloration and very dark eyes had no unusual pigmentation of the iris. The albuminuria was orthostatic.

The patient was one of five siblings, three boys and two girls. His mother, who had no such physical defects, revealed that her husband had hypoplasia of the nails, limitation of motion of the elbows, and weak knees, and that all of her children had abnormal thumb nails, could not straighten their arms out completely, and had weak knees. She commented that her husband was an only child and that she did not know her husband's parents.



Figure 4 Lateral view of the right knee showing hypoplasia of the patella

Unfortunately, none of the siblings were available for examination; however, it is likely that they also have the same condition, hereditary osteo-onychodysplasia.

SUMMARY

In a patient with hereditary osteo-onychodysplasia who showed many of the dysplasias associated with this syndrome the hereditary



Fig 5 Right lateral view of the head showing the hypoplasia of the maxilla and the malocclusion of the teeth.

itary background was established from the history and by correspondence with his mother. This syndrome is a dominant non sex linked disorder. The defects most apt to be present in a

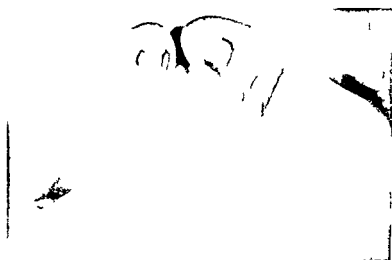


Figure 6 Dysplasia of the mandible.

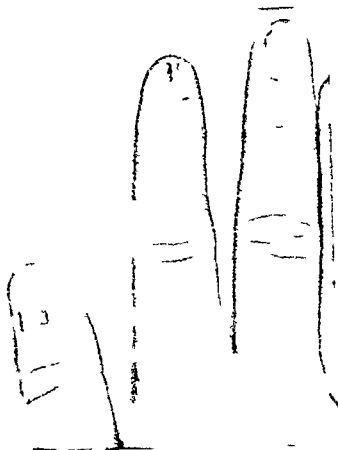


Figure 7 Dyplasia of the right thumb nail and index finger

patient are dysplasia of the thumb nails, abnormalities of the patellas, limitation of motion of the elbows, and posterior iliac horns.

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TABLE 1 Summary of 11 no fatal as fusariform po nu g

Ag	S	Am fw f g d				Sympt m
		Mg pe d y	App ma kg f body w gh p d y f 15 d y	T l mg g d	App m l mg p kg f body w gh g d	
70	M	20	0.33	300	5	H matur d m l t d h d y d pp d gh h d y p d w l l g gh b l d l ur d
66	F	20	0.33	300	5	E hym m d h gh pp d h f f h d y r d w m p d by b l d g f m g m
37	M	20	0.29	300	4.4	B l d g f m h g m beg h f f h d y b d d d h ur d w h g l d b d m s l d h p in h d y
22	M	20	0.31	300	4.68	B l d g f m h g m ur d h f f h d a y d b d m l p d m l h gh h d y
8	F	30	1.33	450	20	E hym pp ar d h l h d y d b l d g f m h gum h h h d y
6	F	20	1.1	300	16.66	E hym ur d h h h d y
34	F	20	0.43	300	5	Gum b l d h f f h d y

TABLE 1 Summary of 12 nonfatal cases of warfarin poisoning—Continued

Age	Sex	Amount ingested				Symptoms
		Mg per day	Approximate body weight per day for 15 days	Total mg ingested	Approximate total mg per kg of body weight ingested	
12	F	20	0.71	300	10.7	Generalized ecchymosis appeared on the sixteenth day
4	M	20	1.17	300	17.6	Generalized ecchymosis appeared on the sixteenth day
19	F	40	0.8	600	12	Ecchymosis developed on the sixteenth day. Bleeding from the nose and gums started on the eighteenth day. Severe shock
29	F	40	0.727	600	10.9	Hematuria and bleeding from the gums began on the fourteenth day
11	F	40	1.45	600	21.8	Ecchymosis developed on the seventeenth day and bleeding from the gums on the thirtieth day

Case 2 A three-year old Korean girl ate a daily average of 30 mg (about 2.06 mg per kg of body weight per day) of warfarin for 15 days. The total amount of warfarin ingested from the corn meal was 450 mg (about 31 mg per kg of body weight) and in addition she was breast fed four or five times daily by her mother who also ingested about 40 mg of warfarin a day. On the eleventh day ecchymosis appeared on her forehead and in spite of the fact that warfarin corn meal feedings were stopped on the fifteenth day a massive nasal hemorrhage occurred on the seventeenth day. The parents were unable to bring the child through the mountains to the aid station and she died untreated six hours after the onset of the hemorrhage.

The remaining cases are summarized in table 1.

COMMENT

By accident a family of 14 obtained possession of 50 pounds of warfarin treated (0.25 percent) corn meal. Because other food was scarce the corn meal mixture was their main diet for 15 days. The symptoms and signs which they developed closely followed in time and order those of laboratory animals on a similar diet. The children seemed to be more resistant to the effect of warfarin than the adults. The high incidence of malaria and intestinal parasites among Koreans by causing a chronic state of low grade blood loss may have decreased their resistance to warfarin. It was seven days however before symptoms appeared 15 days before a death and in spite of inadequate vitamin K therapy and the use of citrated blood instead of fresh whole blood the 12 patients who received treatment recovered within nine days after the ingestion of warfarin was stopped.

Similar incidents could occur in any area where starvation is endemic and large amounts of warfarin are in a vehicle palatable to humans. Marking the containers in the native language or with a skull and crossbones would not necessarily prevent a repetition of this because illiteracy, incomprehension of the poison symbol or transfer of the material to another container by an unwitting person would destroy the value of any such markings. If the vehicle were unpalatable to humans or had an offensive odor however people would be much less likely to eat it and at least would suspect their food if they became ill shortly after eating it. The use of cracked rather than ground grain or charcoal as a coloring agent would be a helpful safety measure but would not change acceptance of the bait by rodents.

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U S DELEGATION DEPARTS FOR NATO MEETING



Members of the United States delegation to the medical planning conference of the NATO nations in Paris 10-12 May 1954 photographed on their departure by air from Washington National Airport. From below: Frank B. Berry, M. D., Assistant Secretary of Defense (Health and Medical); Rear Admiral Lamont Pugh, Surgeon General, U. S. Navy; William S. Middleton, M. D., Dean of the University of Wisconsin Medical School; and a member of Dr. Berry's Civilian Health and Medical Advisory Council: Major General George E. Armstrong, Surgeon General, U. S. Army; and Major General Harry G. Armstrong, Surgeon General, U. S. Air Force.

Reconstruction of Tracheal Lumen by Skin Graft and Cicatricial Diaphragm Method

BERNARD N SODERBERG C I I MC USA

ARNOLD A ALBRIGHT C I I MC USA

JOSEPH A BUDETTE L i n a n t C I I MC USA

THIS case report illustrates the use of a free skin graft to reconstruct the lumen of the trachea. Our technic is a modification of the established method. To the best of our knowledge this is the first case in which this altered procedure has been used in reconstruction of the lumen of the trachea. It permitted the successful repair of a low lying stricture.

CASE REPORT

The patient was a 25 year old man who had received multiple shell fragment wounds to the body and neck. In 1946 when the patient was first seen by one of us he had a tracheotomy tube in place and the adjacent soft tissue was extensively destroyed and replaced by scar tissue. The patient was unable to speak or pass air through the proximal end of the trachea. Laryngoscopy and roentgenograms revealed a complete cicatricial obstruction above the tracheotomy orifice in the area of the second, third and fourth tracheal rings. This involved area measured about 1.5 cm. in vertical height (fig. 1 a and b).

On 19 August 1947 surgical repair was performed under cervical block anesthesia. A transverse incision was made about 1 cm. above the tracheotomy opening. The upper edge of the incision was undermined and retracted and the lower edge was undermined up to the tracheotomy fistula without entering its lumen. The trachea was entered by vertical incision and the dense scar was excised from above downward. All cicatrix was removed except a thin layer just above the tracheotomy opening. The freshly formed proximal area was then skin grafted (fig. 1c). The stent-supported graft was transfixed by through and through tantalum wires which were passed laterally through muscles, subcutaneous tissue and skin and were tied externally after closure of the skin edges. During the early morning hours of the fifth postoperative day the tracheotomy tube became completely obstructed. Because the patient became deeply cyanotic and the surgical officer of the

F m P y J Army H p l B l Gr k M b (w na t d) Col Sod
be g w g d t B k A my H p l F r S m H us T

day could not get to the patient soon enough the nurse in charge removed the tracheotomy tube and freely aspirated through the tracheal opening. The patient's cyanosis cleared. A clean tracheotomy tube was inserted and the subsequent postoperative course was uneventful. Ordinarily, however secretions and blood clotting in the tracheal tube would not be troublesome if the in-

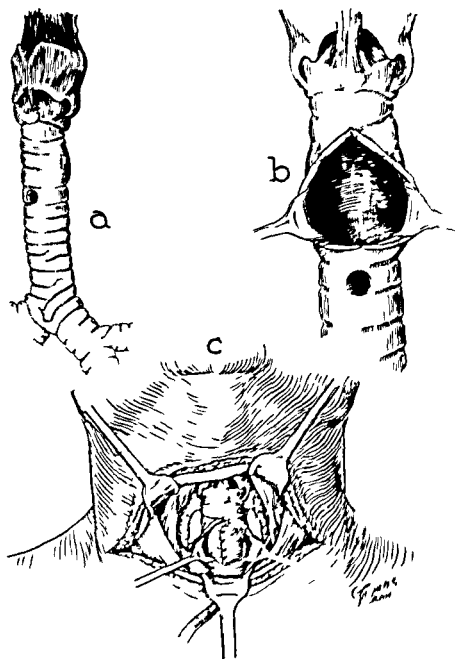


Figure 1. Complete obstruction of the trachea by a neoplasm at the tracheotomy orifice. (a) The location of the orifice. (b) The tracheal diameter localized by the tumor. (c) The tumor covered with the trachea and placed in the trachea to form the trachea created by surgical closure of the area.

ner tube were removed every hour or two and cleaned. On the tenth postoperative day the stent was removed through a bronchoscope. The successful growth of the graft reconstructed the lumen. The fibrous diaphragm above the tracheotomy opening was

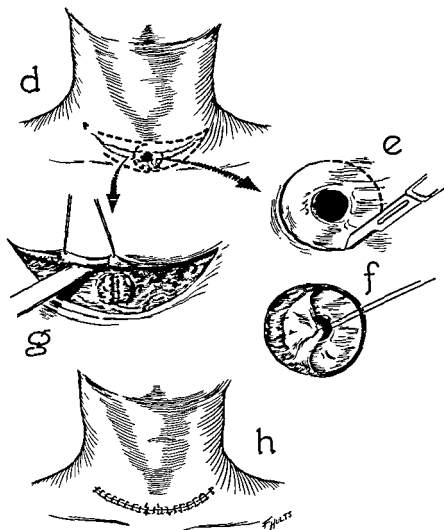


Fig. 1. Clinical course of the tracheotomy of a cat. (d) The area of cat x was excised and a graft of cat x was placed in the tracheotomy site. (e) Line of incision for flap over flap. (f) One flap mobilized to midline. (g) Adjacent flap mobilized to midline. (h) Suture line of flap. Suture line are at right angle.

excised by loop cautery through the tracheotomy orifice on 15 October 1948. As soon as the lumen was open for clear air passage the patient could speak.

Subsequently the tracheotomy orifice was closed by using two small, adjacent turnover flaps and superimposed adjacent soft tissue closure (fig 2) Skin flap rotation was not required because the peripheral cicatrix had sufficiently softened

A recent follow up five years after the repair was completed indicates the patient to be living and well, performing normal activities

DISCUSSION

Arbuckle¹ was the first surgeon to use skin grafts within the larynx for treatment of laryngostenosis There is further discussion of skin grafts used this way by Erich,² Figs,³ Foster, Negus,⁵ and Le Jeune and Owens⁶ The technic described by Frich for the repairs of extensive cicatricial stenosis of the larynx or upper part of the trachea has been accepted as a standard method of repair

Ordinarily each patient with scar obstruction within the lumen of the larynx or trachea is considered first on the basis of its cause, second, its location and extent and third its relation to the location of the tracheotomy opening

The cause is significant if the stricture had resulted from a specific granuloma such as syphilis, tuberculosis, blastomycosis or neoplastic growth The severest obstructive stricture observed usually results from trauma which might be a war wound or irradiation with resulting perichondritis

Laryngoscopy is used to determine the location and extent of the cicatricial stenosis Visualization of the lower part of the stricture through a tracheotomy opening is helpful Lateral roentgenograms may be of some assistance to outline the extent of the lesion

When the tracheotomy opening is situated adjacent to the stricture a secondary tracheotomy is indicated well below the stenosis Ordinarily, for a successful operation, the new tracheotomy opening should be located about 2 cm below the obstruction Subsequent to skin grafting acrylic distenders which should be left in place about six months are used to overcome contraction

In the patient presented, first consideration was given to an operation which would follow the previously designed technics The low lying tracheotomy orifice, however, made this impractical The tracheotomy tube was not passed through a stent-supported skin graft because we believed that, should it become necessary to remove the tube as a postoperative emergency measure considerable difficulty might be encountered in ob-

taining a free airway due to the presence of the stent. The cicatricial diaphragm procedure eliminated the necessity of this latter method.

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Centennial of Von Behring

Emil von Behring one of the greatest benefactors of humanity was the son of a schoolmaster who had 11 other children. He was born at Hansdorf Deutsch Eylau West Prussia on March 15 1854 the day following the birth of Paul Ehrlich. He took his doctor's degree at the University of Berlin in 1878 and passed the State examination in 1880. He began his career as a military surgeon serving in the Army Medical Corps first at Posen then in 1887 at Bonn as staff surgeon and lastly in the same rank in 1888 at the Army Medical College Berlin. His first published paper (1887) dealt with iodoform as an antiseptic.

While still an army surgeon Behring was impressed by the discoveries in bacteriology which were revealing the cause of a number of diseases and especially by the great work of his compatriot Robert Koch. In the early eighties therefore he began a series of investigations which were the precursor of his main lifework. Bacteriologists had noted already that white rats were immune to anthrax while wild rats were susceptible. Behring took the fresh serum of white rats and tested it on anthrax bacilli *in vitro*. In a short time the bacilli were killed. Nuttall had made similar observations on the bactericidal powers of the fresh sera of man and of several animals and his observations together with Behring's findings led to the humoral theory of defence against the invasion of germs into the animal body.

—SIR ARTHUR S M NALTY M D

B r h M d l J urnal p 668

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Bilateral Congenital Absence of the Serratus Anterior

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JAY F. TUTTLE *Lieutenant Colonel, MC, USA*

CONGENITAL absence of important skeletal muscles is uncommon. Although any muscle may be absent, those of the shoulder, neck and upper trunk, particularly the pectoralis, are most frequently missing. Ford¹ stated that these abnormalities are primary nonprogressive defects of the muscular system and unilateral in most instances. He reported 14 cases, one pectoral muscle was partially or completely absent in seven and the right trapezius was missing in one. Bing² in a survey of the literature reported 102 cases of defects of the pectoralis muscles, 15 of the trapezius and 14 of the serratus anterior muscles. Because of its comparative rarity we are reporting a case in which the serratus anterior muscle was absent bilaterally.

CASE REPORT

A 20 year-old soldier was admitted to the hospital for a neurologic examination because he was unable to do push-ups in physical training. He had winging of both scapulae, the serratus anterior muscles were absent as well as the lower portion of the sternal segment of the left pectoralis major (fig. 1). He was otherwise well developed with no evidence of other abnormalities, and the neurologic examination was negative. He was able to pull his shoulders forward to an abnormal degree but could not raise his arms 90 degrees above his shoulders or do push-ups. Pushing against resistance increased the winging of the scapulae (fig. 2). He had no difficulty in performing such routine acts as dressing, writing, eating and making his bed.

The patient's mother and younger brother also had winged scapulae. He had been active as a boy and participated in sports such as baseball and swimming, although he always felt "tight" across the shoulders and had been unable to exercise on parallel bars because his shoulders "popped out." He had worked as a postal clerk, often lifting heavy packages. It was not until he was required to take daily physical exercises in the service that

his disability was revealed. There was no history of acute neuromuscular disease such as poliomyelitis.

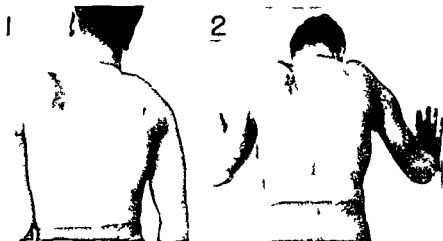


Fig. 1. W. G. G. f. cap. la. d. to ab. c. f. er. tus. a. t. or. m. cl. s.
 Figur. 2. P. o. n. c. d. w. g. g. of scap. la. whe. pat. t. push. d. ag. n. t.
 t. nc.

Because of the patient's previous good adjustment no remedial therapy was indicated and he was returned to duty with a lower profile.

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Primary Tumors of the Rib

Primary tumors of the rib, though uncommon as compared with similar tumors arising in other bony structures of the body, are not so rare as has been supposed. Such new growths are recognized more frequently today than in the past because of the improved diagnostic methods and the more complete knowledge on the part of the clinician, radiologist, surgeon, and pathologist of the nature of these lesions. This greater familiarity with these tumors has led to the erroneous impression that the incidence of rib tumors is rising. That this is not the case becomes obvious from study of the cases reported in the world literature for the last half century. Such studies also show that all types of primary neoplasms, not only of bone and cartilage, in other parts of the skeleton may also be encountered in the ribs.

—LEWIS A. HOCHBERG, M.D.

A. M. A. A. b. s. / S. gery p. 566 Oct. 1953

Psychologic Factors in Angioneurotic Edema of the Pharynx

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CHARLES W SOCARIDES *Lieutenant (MC) USNR*

SINCE the "fugitive inflammation" mentioned in 1843 by Graves¹ was described by Quincke² in 1882 as angioneurotic edema, the presence of psychologic disturbance in patients suffering from this condition has been observed. Despite this auspicious start in the psychologic understanding of angioneurosis, or neurosis affecting the blood vessels, few psychodynamically oriented case reports have been made.

The psychiatric investigation of skin conditions have led to the following conclusions which have been verified by various investigators and are now generally accepted: (1) The skin is an organ for the expression of emotion *e g* blushing, blanching. (2) As the covering for the body, the skin can become the screen on which exhibitionistic conflicts are expressed. (3) Because of its sensory function, the skin may be used in the rudimentary expression of pain and pleasure. These sensations may include pain dependent sexual pleasure (masochism), or gastric (sexual) pleasure, and painful sensations of a nonerotic nature *e g*, sensations occurring as due punishment for unconscious feelings of guilt. (4) As the skin has a blood supply and an autonomic innervation, the emotions of fear and rage and derivative emotions influence its nourishment and health. (5) Indication of a relationship between fluid secretion of the skin and emotional disturbance has been illustrated by the correlation of fluid secretion with weeping noted by Kepets and associates.³

FORMS OF ANGIONEUROTIC EDEMA

Angioneurotic edema is characterized by temporary, well-defined, edematous swelling of the skin or mucous membrane occasionally of the viscera (glottis or gastrointestinal tract or, rarely, the brain). The lesions themselves may persist from hours to days and be accompanied by burning and itching, or be without sensory phenomena. Modern medical opinion⁴ is that there are two forms. The first is nonhereditary and relatively benign. It is usually due primarily to food allergy or is associated with urti-

caria focal infection or endocrine disturbances. In many cases however the causes are undetermined. It is evenly distributed between sexes and frequently has an onset at puberty. The second form the apparently hereditary type, appears to have a more serious prognosis because the patient may develop a fatal edema of the glottis. In some cases a food allergy has been demonstrated. This form according to Mackenzie may be transmitted without sex linkage through several generations both by affected and unaffected individuals but transmission does not appear to be in accord with the theoretic expectations of a Mendelian dominant.

The mechanism involved has been compared to that occurring in urticaria. In urticaria however the superficial vessels of the skin are involved in angioneurotic edema, the deeper vessels. A vasodilator substance probably histamine produces the vasodilation and transudation.

Visceral involvement usually of the glottis occurs only rarely in the nonhereditary form. According to Bulloch, who published an extensive report in 1909 this alarming condition caused death in 21.1 percent of 170 patients. It would appear, however that the criteria for the division into hereditary and nonhereditary forms are inconclusive. They seem to be based on whether or not recovery occurs within several years. Kallman believes that the balance of available data favors the theory that angioneurotic edema is distinct from the common forms of allergy inherited as a simple dominant and that genetic predisposition is dominant in a very irregular manner i.e. transmission by a pair of alleles Hh, of which h determines the allergic condition. The case herein described, although involving the throat and larynx and occurring in both mother and daughter need not be hereditary in type. An alternate psychodynamic explanation is given.

Epinephrine and ephedrine may alleviate attacks but attempts to remove allergens commonly considered to be foods usually have been unsuccessful. Antihistaminic drugs have been proved more efficacious if taken early in the attack. A severe edema of the larynx may constitute an acute medical emergency and necessitate tracheotomy.

CASE REPORT

The patient a 30-year old enlisted woman was constantly harassed and frightened in childhood by her half sister who was two and a half years older. She was cared for by a housekeeper during most of her childhood because her parents were divorced when she was 15 months old and her mother remarried when she was five year old. Within a year of her mother's remarriage a

stepbrother was born of whom she has always been very resentful. Two more siblings were born, one when the patient was nine years old and the other when she was 13 years old. A stepsister developed poliomyelitis at the age of 14, and as she grew older the patient and she became further apart. In 1946, when the patient was 22 years old, her mother, age 51, died suddenly of what the patient believed was an attack of angioneurotic edema. The mother had had this condition as long as the patient can remember. One evening while doing some shopping she became "upset." The next morning she awoke with her face swollen, peered at herself in the mirror, suddenly could not catch her breath, and died. The patient knows little of her father. At the age of 14 she was severely ill and placed in an oxygen tent. Her father fled upon seeing her coughing desperately and apparently dying. She states that she has "no feeling for him whatsoever" and is not upset by his behavior toward her.

In her early childhood she has a screen memory of forced feeding by her mother. Her mother would "clamp her hand over my throat, and I felt like choking to death." She is vaguely aware of a constant feeling of loneliness, chronic fears of the dark, and social discomfort. She also felt unwanted during her childhood years.

Allergic conditions have been notably absent in all members of the family except the mother.

The patient's complaints first appeared in 1936 at the age of 14. At that time she had been in the hospital for nine weeks and had undergone a mastoidectomy. Subsequently, she developed pneumonia with complications. A rib resection on the right side was done for empyema. Nine days following operation her hands and left forearm suddenly began to swell, and it kept going down into my throat. This swelling persisted for a few days and then disappeared. There were no attacks from the ages of 14 to 19, when both hands and feet were suddenly affected. At this time the attacks began to have a characteristic course. They came on slowly and disappeared within four or five days. After the swelling began its insidious course, there was a rapid increase to the maximum point. At 19 while away from home the patient developed "influenza," and a physician remarked that she had "stomach ulcers" too even though she complained only mildly of stomach pain. She became frightened by this pronouncement, developed an attack, and went home immediately.

Except for her first attack in 1936, there were no choking spells and involvement of the neck until 1945. In February 1945, in the excitement of being accepted for enlistment for overseas service, she got all excited, and woke up one morning with a very

full feeling in my throat Laryngeal swelling and difficulties in breathing were controlled by epinephrine During 15 months in Hawaii, she had two separate attacks, both localized in the left hand

The patient had two episodes in 1950 After transfer to her present duty station in 1951 she developed attacks about every two months with swollen hands and arms and involvement of her throat On one occasion she became acutely ill with edema of the glottis The medical officer unfortunately not perceiving that the patient's irritability was a defense against strong dependency needs reacted to it with counterirritation Medication failed to alleviate the attack and a tracheotomy tube was placed beside the patient's bed Because her anxiety mounted psychiatric consultation was requested and the patient was almost immediately relieved of her symptoms by one of us, through reassurance and patient listening to her life story This was the beginning of her insight into the emotional nature of her illness She believes that her attacks in 1951 were probably due to a "conflict of personalities" with her superiors and other associates After this initial psychotherapy and subsequent change of duty, her attacks disappeared completely for one and a half years

The patient's most recent attacks have been mild and usually occur in a setting of suppressed or repressed rage She stated, "I feel a gripping in my throat and I can tell it is just my anger building up" On one occasion when she was questioned by the police about an automobile accident in which her car was involved "I became tightened up in my throat and angry inside Her symptoms may not appear immediately upon becoming upset but only after the pressure of the situation has disappeared and upon reliving the incident in fantasy The over all severity of attacks has decreased since the beginning of treatment by the psychiatrist Severe edema of the throat has not recently occurred and the patient is greatly encouraged by her progress In quiescent periods she does well in her job as clerk typist

Skin tests at various intervals in the past have revealed questionable positive reactions to celery apple, and house dust Careful dietary measures and investigation with the omission of certain foods have had no effect on the frequency of attacks

DISCUSSION

With progressive adaptive failure throughout life, both in the social and sexual areas there were increasing tendencies for this patient's attacks to become worse and to occur more frequently This course in spite of what allergic factors may exist has been impeded by brief psychotherapy The attacks themselves are unconscious moves of repair against her fears of

abandonment and excessive feelings of rage Alexander⁷ has remarked that these persons find it difficult to cry. There is an almost complete denial of welfare emotions, e. g. love, joy, and tender receptive feelings. Lorand⁸ reported a case of angio-neurotic edema in which dependent desires were a crucial issue in the development of this condition. There are certain similarities in his report with this one.

In a recent study of 35 patients with urticaria, Wittkower⁹ cited a complaint shared by sufferers in both groups. Two thirds of his patients spontaneously stated that they missed parental, especially maternal, affection as children, even though this belief may have been unfounded. It is apparent in our opinion that such a patient's excessive need for the parent may be engendered because of severe anxiety experienced at an early age from a cause totally unrelated to maternal loss or deprivation. In a large number of his patients (19 out of 25) the onset of urticaria was preceded by disturbing events entailing anticipated or actual withdrawal of love.

SUMMARY

A description of the role of psychologic factors in the production of attacks of angioneurotic edema emphasizes that throat involvement with the attendant danger of asphyxiation constitutes a psychiatric as well as a medical emergency.

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Aneurysm of the Temporal Artery Due to Trauma

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WALEED G MALOOF *Capt* *USAF (MC)*

ANEURYSM of the temporal artery is rare and mentioned only infrequently Winslow and Edwards^{1 2} in 1934 extensively reviewed the literature and reported 108 cases of which 15 were arteriovenous Seventy nine were due to trauma either penetrating or blunt Since then occasional reports have ap-



Fig 1 Postoperative appearance of temporal artery.

peared³⁻⁵ Its predominant occurrence in males is because of their greater occupational exposure to trauma When bloodletting by temporal arteriotomy was common during the nineteenth century in the treatment of cerebral congestion, meningitis and apoplexy aneurysms were more frequent They also occasionally

followed rapier slashes inflicted in students' duels at German universities

The tumor varies from pea to orange size, but is generally no larger than a walnut. Because of progressive enlargement, pulsations and throbbing, increased susceptibility to injury due to superficial location, and a certain degree of disfigurement, treatment of the aneurysm is indicated. Perrett⁴ reported a traumatic arteriovenous aneurysm producing noises in the ear which responded to proximal and distal ligation of the artery and vein.

The differential diagnosis includes sebaceous cyst, pulsating hematoma, and abscess. However, the characteristics of pulsation (which disappears after proximal compression), the history of trauma, and the site of the lesion lead to the diagnosis.

Various procedures, including proximal suturing of the artery, proximal and distal ligation, and ligation of the external carotid artery, have been attempted to correct this condition. Prolonged digital compression and injection of sclerotics were used before



Figure 2 Surgical specimen. (P) The proximal portion of the artery

the turn of the century. Because there is a rich anastomotic network of the branches of the external carotid artery, excision of aneurysm after proximal and distal ligation of the temporal artery will not result in any circulatory embarrassment to that portion of the scalp, and is the most effective procedure.

CASE REPORT

The patient was a 31 year old man who presented himself against a steering wheel when in an auto accident three weeks prior to admission. Three days later a lump appeared anterior to his left ear just above the ear which increased in size until admission.

Physical examination was negative except for a pulsating and slightly movable soft tissue mass over the left temple 4 cm in diameter and not attached to the skin. Its pulsation was synchronous with the heart beat. Proximal compression of the superficial temporal artery caused the pulsation to cease but the mass, although smaller persisted. No bruit could be heard over the mass. Urinalysis and blood count were normal and a serological test for syphilis was negative. Roentgenograms of the skull revealed no erosion of the bone. In view of the noticeable enlargement and the superficial location surgery was advised.

On 22 October 1953 under local anesthesia the aneurysm was exposed through a small transverse suprazygomatic incision with in the hairline and excised. The proximal and distal branches of the superficial temporal artery were ligated. The terminal



Fig 3 Sp c m ope d. The normal l w ll at the sup marg n. Not the cl i / ll g the sac b low

branches of the artery, the frontal and parietal which originated just distal to the aneurysm were ligated separately. The pathology report was "temporal artery traumatic aneurysm" (figs 2 and 3). The postoperative course was uneventful and the patient was returned to duty two days after operation. He was seen one month later and the anatomic and cosmetic results were excellent.

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As Others See Us

Another error we as physicians have at times been guilty of might best be described by the following situation. A husky young recruit in a basic training unit appears on sick call with a respiratory infection. He is seen by an eager young medical officer just out of his internship and anxious not to forget how to use his stethoscope. The officer listens to his young patient's chest with an air of clinical enthusiasm and picks up a heart murmur. * * He makes some casual mention of it in all innocence and perhaps thinks little more about it until perhaps the very next day when a worried, anxious looking GI—the same husky recruit again appears on sick call. * * * His cold is improved but this time he is really concerned about whether or not he has heart disease. The young medical officer again listens to his patient's chest and heart. Today perhaps the murmur seems a bit louder and a bit more harsh. The young medical officer heard a murmur which he thought was interesting but little more. But now he has a young soldier on his hands who wants to know about his heart. Like all young medical officers, he sees no reason whatsoever to assume the responsibility of reaching a decision concerning the significance of this murmur and so the "buck passing" begins. He refers his patient to the cardiac clinic at the post hospital so a specialist may evaluate the situation. Now it is important to remember that the army cardiologist frequently has an entirely different attitude toward his military patient than he would have toward a private patient. He sees the young soldier, examines him, orders an electrocardiogram, perhaps fluoroscopes the patient, orders some chest roentgenograms and about anything else that pops in his mind.

After all this let us assume that a correct diagnosis of an insignificant functional murmur is made and the young soldier is told that he has nothing of significance wrong with his heart and he is returned to duty. Somehow after all this attention has been directed to his heart, our young recruit finds it a bit difficult to swallow the fact that there is nothing wrong with it. You see, a seed is planted in good soil, it is fertilized and well attended, it grows and we have another cardiac neurotic well on the way.

—PAUL SIMPSON, M.D.
U.S. Army, Kentucky U.S. Army
 p 474 Nov 1953

Relief of Severe Pruritus Ani by Presacral Neurectomy

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GEORGE M MALKIEWICZ F t L ut t USAF (MC)

IN many severe cases of pruritus ani no definite causative agent can be identified and current treatment leaves much to be desired. It is not within the scope of this article to discuss pruritus ani comprehensively but to present a single case of severe intractable pruritus ani in which the patient experienced immediate and complete relief after presacral neurectomy. The operation was performed only after the patient was given a reasonably complete clinical and laboratory study to discover a causative agent, and after it had been demonstrated that he obtained indisputable relief from a presacral block with piperocaine hydrochloride (metycaine hydrochloride).

We have found no record of presacral neurectomy previously having been performed for pruritus ani.

CASE REPORT

A 25 year old man admitted to this hospital on 26 January 1954 complained chiefly of perianal itching of three years duration. His distress had been more severe during the past year and he had obtained no relief from a wide variety of local applications. He had not received roentgen therapy. The past history and the family history were noncontributory. He had never been outside the United States.

On examination the perianal skin was thickened whitish and thrown into folds and sulci. Numerous areas had been denuded by scratching. No enlarged papillae, abnormal crypts or external or internal hemorrhoids were noted. Proctocolonoscopy for a distance of 20 centimeters revealed no abnormal findings. It was our impression that the patient was emotionally stable.

Indicated laboratory studies revealed no significant findings.

A block of the patient's lumbar sympathetic nerves bilaterally with piperocaine hydrochloride had no effect on his itching but one of his presacral nerves according to the technic of Flothow with piperocaine hydrochloride resulted in complete relief of

the patient's itching for about six hours. A biopsy of the perianal skin, less than four millimeters square, was taken under procaine hydrochloride anesthesia. This procedure had no effect on the patient's itching.

At operation, the presacral nerves were resected according to the technic of Adson and Misson,² and a second biopsy of the perianal skin was taken at the verge of the anal canal. Because the first skin biopsy did not affect the patient's itching and excision of a piece of perianal skin less than four millimeters square usually will not relieve severe pruritus ani, it was believed that the second skin biopsy would not confuse the results of the presacral neurectomy.

Microscopic examination of the excised portions of the perianal skin showed a prominent degree of acanthosis with a lesser amount of hyperkeratosis and parakeratosis. In some areas there was a coalescence of the rete cells. There was fibrosis in the papillary portions of the derma and a light to moderate diffuse infiltration of lymphocytes with fewer numbers of monocytes. In many instances the inflammatory cells were located perivascularly. There was dilatation of the lymphatics in the mid part of the derma, and a light degree of fibrosis was noted throughout the entire corium. The tissue excised at the time of the presacral neurectomy showed numerous nerve fibers cut longitudinally and on cross section. They were surrounded by collagenous connective tissue varying in density and large fields of adipose tissue.

The morning following operation a careful interview was conducted with the patient. Mention of his rectum was avoided in an effort to induce him to volunteer a statement concerning his itching. When he did not offer any comment he was asked, "How is your rectum?" His reply was, "I don't feel anything there." He was then told that another biopsy of his perianal skin had been taken. He was surprised and repeated his former statement. At the time of writing, 10 days after operation, the patient has had no perianal itching.

DISCUSSION

A report of a single case of severe intractable pruritus ani treated by presacral neurectomy seems justified, not only on the grounds that the patient experienced immediate and complete relief from his itching, but also because the operation is not being done currently in the treatment of this distressing condition. This report may enable other proctologists to perform the procedure in the critical manner that will establish its proper place, if any, in our armamentarium. Evaluation of the operation will require time. Buie³ based his appraisal of his own large experience with pruritus ani on a two year follow up period, or longer.

The idea of performing presacral neurectomy occurred to one of us (C S) while reading a paper in the French literature (exact reference now lost) on the relationship of the sympathetic nervous system to itching sensation. The superficial similarity of the skin lesions of pruritus ani, often called a neurodermite and those of scleroderma was recalled. When the patient reported on here experienced indisputable relief from a block of his presacral nerves with piperocaine hydrochloride it was decided with the patient's full understanding of the nature of the procedure to resect his presacral nerves. Because of the intensity of his distress and the failure of many conservative measures to relieve him the patient did not hesitate to accept the operation. He merely asked how soon it could be done a common reaction of patients with severe pruritus ani. The complete and immediate relief afforded by the operation resembled the dramatic relief that sympathectomy brings to patients with major causalgia. It is interesting, too, that the patient suffered no distress following the biopsy of his perianal skin distal to the anal canal, a procedure usually followed by considerable pain. The experience of the patient who said he didn't know he had a rectum after presacral neurectomy for pruritus ani is at least an interesting commentary on our knowledge of the autonomic nerve supply to the anus.

Presacral neurectomy is not a difficult operation. Like any major surgical procedure it is not without hazard. To some it may seem a formidable procedure for the relief of itching but not so to patients with severe pruritus ani. The operation should be attended by less morbidity than that resulting from sloughing of the perianal tissues which may follow the local injection of alcoholic solutions.

In the present case blocking of the presacral nerves with piperocaine hydrochloride resulted in temporary but indisputable relief of the perianal itching. This procedure may prove to be a useful means of selecting patients for operation.

In reporting this case we have no intention of suggesting that presacral neurectomy be performed upon patients with pruritus ani in whom a cause can be established that responds to more conservative measures.

ADDENDUM O m th ft p t wh th p t t w d m ed
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The First Hypodermic Syringe

One hundred years ago a French physician Charles Gabriel Pravaz (1791 1853) of Lyons France introduced into medical practice the use of the hypodermic syringe The syringe was provided with an external nut working on a thread cut about the piston so that the contained liquid could be extruded drop by drop Another novel it m of this syringe was a slip joint the needle being of steel and the hub of hard rubber

Alexander Wood (1817 1884) of Edinburgh was the first physician to use this hypodermic syringe for the administration of drugs He injected morphine hydrochloride into patients with intractable neuralgias in all of them a remarkable rapidity of the effect of the drug was demonstrated Wood concluded correctly "that in all probability what is true in regard to narcotics would be found equally true in regard to other remedies The Pravaz syringe affords a safe easy and almost painless method of parenteral therapy "

—SAMUEL J ZAKON M D
in A. M. A. *Abstracts of Dermatology*
and *Syphilology* p 591 No 1953

The Problem of Thromboembolism

What has long been badly needed is a reliable test for the presence of venous thrombosis or better yet, incipient thrombosis This field of course has not been entirely neglected but unfortunately none of the multifarious tests which have been proposed and employed for determining the presence of venous thrombosis as well as for the prediction of its occurrence has proved satisfactory Indeed this aspect of the problem is as confusing as any for as each test has been hopefully presented usually on the basis of preliminary observations other reports have often followed to shatter the hopes with conflicting or refutatory evidence

—MICHAEL D DeBAFFEY M D
in *Syphilology and*
Gynecology p 17 J n 1954

GEN SNYDER PROMOTED NAMED TO SUCCEED GEN LOVE AS CHIEF OF ARMY DENTAL CORPS

Major General Oscar P. Snyder, World War II Chief Dental Surgeon of the Southwest Pacific Theater, was sworn in on 12 April 1954 as Assistant Surgeon General of the Army and promoted from a brigadier general to the higher grade. On 30 April he succeeded Major General Walter D. Love as Chief of the Army Dental Corps and Chief of the Dental Division in the Office of the Surgeon General. General Love was retired after more than 37 years of military service.



Major General Oscar P. Snyder, right, is shown taking the oath of office as Assistant Surgeon General of the Army administered by Major Daniel E. Mabus, MSC, USA, the president of Major General Stanley B. Hay, left, Deputy Surgeon General and Major General Walter D. Love, his predecessor, Chief of the Army Dental Corps.

General Snyder is a former vice president of the American Dental Association, a member of the Psi Phi dental fraternity and Omicron Kappa Upsilon honorory dental fraternity, a fellow of the American College of Dentists, and consulting editor of the *Oral Surgery Oral Medicine and Oral Pathology*. In May 1951 he received the Alumni Award of Achievement from Ohio State University.

Advantages of the Keratometer in Refraction

BERNARD G PLATT *Lieutenant Commander (MSC) USN*

THE keratometer, or ophthalmometer, is a very important adjunct to the armamentarium of any refractionist. I have been using one for over five years, and in performing over 15,000 refractions have found its calculations very helpful in arriving at the final prescription.

The use of the keratometer is simple and can be mastered in a very short time. At the completion of the viewing of each eye, readings are made on the horizontal (left) drum and on the vertical (right) drum, and the difference between the two readings is the corneal astigmatism of that eye. The axis of the keratometer cylinder is read on another dial.

Keratometer findings are read as illustrated in the following:

Vertical (right) drum	42.75 D
Horizontal (left) drum	41.25 D

Difference (corneal astigmatism)	<hr/> 1.50 D WR (with the rule)
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If the axis markers point to 90 and 180, the difference between the drum readings being 1.50 D and the most power being in the vertical meridian, the recording is 1.50 WR axis 90 (using plus cylinder).

The power of the corneal astigmatism will be modified by:

1. **Javal's rule.** In with the rule astigmatism, increase the keratometer finding by one fourth of its value, then deduct one half diopter. In against the rule astigmatism, increase the keratometer finding by one fourth of its value, then add one half diopter. This is an over all rule to be used with caution, as it will not apply to every case.

2. **The strength of the correcting spherical lens.** The more plus sphere, expect less subjective cylinder than would be expected after Javal's rule is applied. The more minus sphere, expect more subjective cylinder than would be expected after Javal's rule is applied.

The axis may be modified by the lenticular astigmatism hence the final axis of the correcting cylinder should not be expected to be the same as the keratometer axis

Speaking in terms of plus cylinders if the axis of the keratometer cylinder is at 180 the correcting cylinder axis will be at or very close to 180, but if the keratometer axis is at 165 the final correcting axis will lie between 165 and 180. The higher the correcting cylinder, the closer to the keratometer axis will be the final axis. If the keratometer axis is at 90 the final cylinder will be at or very close to 90.

When a keratometer is used weak cylinders can be prescribed with more confidence, as illustrated by the following case in which the patient was hesitant in the various subjective tests in deciding between 1/4 D or 1/2 D cylinders.

Keratometer findings O D 1.50 WR axis 90

O S 1.50 WR axis 90

Considering the keratometer findings I would prefer the 1/2 D cylinder but if the keratometer finding had been 0.50 D WR I would prefer the 1/4 D cylinder. Determining the final axis is made much easier by considering the keratometer axis especially when because of a weak cylinder the patient experiences difficulty in deciding.

There are many more aids that the refractionist gets from the keratometer. After a while he depends on this instrument as much as he does on the retinoscope.

SUMMARY

Use of the keratometer aids the refractionist in many ways. It helps in deciding whether or not a small cylinder should be prescribed, in immediately determining the presence of any sizeable amount of astigmatism and by revealing the presence of irregular astigmatism through the distortion of the mires reflected from the cornea. It gives the refractionist a preliminary idea of the patient's visual acuity when a low amount of with the rule astigmatism is found in one eye and any amount of against the rule astigmatism is found in the other. It warns of a possible lower acuity in the latter eye. Through its use a more accurate cylinder can be prescribed in aphakia in which condition the patient usually experiences difficulty in deciding on the proper cylinder in the subjective tests. Finally it helps in prescribing contact lenses. When the mold method is not used the curvature of the cornea is obtained with the keratometer which enables proper curvature to be ground into the contact lens.

Inadequate Arch Support in Shoes

ROBERT KENDRICK *Orthopedic Technician*

GEORGE H CHAMBERS *Major USAF (MC)*

PATIENTS with foot and leg complaints are common in all orthopedic clinics, civilian or military. Acute and chronic foot strain with tenderness of the intrinsic muscles of the foot, tenderness of the plantar calcaneonavicular (spring) ligament, and frequently with tenderness of the bellies of the tibial and peroneal muscles are perhaps more common in military personnel, particularly at indoctrination or training centers. The trainee is of necessity subjected to long hours of standing and walking. He is given issue shoes of the brogan and low quarter types with reasonable care as to proper fit. Many are observed with foot complaints from the beginning of their training. Six weeks to three months later another group is seen with findings of acute and chronic foot strain.

Examination frequently reveals the shoes to be at fault because the shank, having given way, allows the arch of the shoe to sag, creating a "rocker bottom" effect (fig 1). This is more common in the long, narrow and in the low quarter shoe than in the brogan. The issue shoe, both brogan and low quarter, is fitted with a spring steel shank of metal, five eighths by four and one half inches. In the low quarter shoe a fiber backing is used for additional stiffness, whereas in the brogan stiffness is supplied by the extra thickness of the sole. In the heavier person, and particularly one with a long, narrow foot, this support is inadequate and allows the shoe to sag in the center and to raise on the ends. Frequently the patient will state that it feels as if he is walking over a ridge in his shoe.

Transverse bars in the metatarsal region is the simplest means for correction of these shoes but with repeated application of bars the sole may break and an undesirable hump may appear inside of the shoe. The insertion of combination supports within the shoe itself is helpful but does not stop the deformation of the shoe. Replacement of the metal shank by a spring steel shank of heavier steel hammered into proper contour before insertion (fig 2) has proved entirely satisfactory. Such shanks were purchased locally in dozen lots at a cost of 12 cents each from a

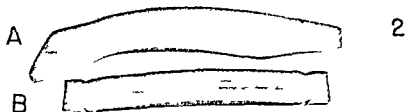
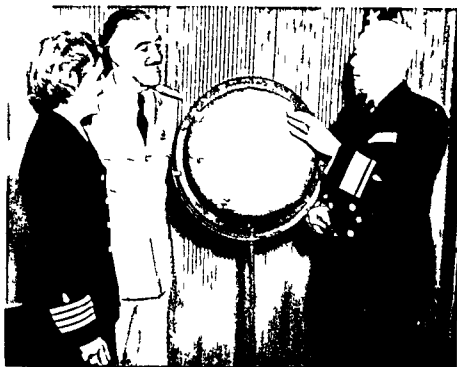


Figure 1 A low-quarter shoe with high arch. Figure 2. Steel arch shanks. (A) Heavy steel hammered into proper contour. (B) Shank from the heel. Figure 3 A low-quarter shoe six months after replacement of shank. The figure illustrates the arch and the flat.

shoe supply company. Shoes so repaired have been used for six to eight months until virtually worn out with continued maintenance of the shoe form (fig 3) and no return of arch or heel symptoms.

REAR ADM HOGAN AND CAPT JACKSON NAMED TO HIGH POSTS IN NAVY BUMED

Rear Admiral Bartholomew W Hogan has succeeded Rear Admiral Clarence J Brown as Deputy Surgeon General of the Navy and Assistant Chief of the Bureau of Medicine and Surgery and Captain Leona Jackson has been appointed the fourth Director of the Navy Nurse Corps. Admiral Hogan reported for his new assignment just prior to the departure for Paris last month of Rear Admiral Lamont Pugh Surgeon General of the Navy for the medical planning conference of senior medical representatives of the NATO nations.



Rear Admiral Lamont Pugh (right) is shown briefs his new assistants Rear Admiral Bartholomew W Hogan (MC) USN and Captain Leona Jackson (NC) USN

Admiral Brown and Captain Winnie Gibson (NC) USN Captain Jackson's predecessor were both retired from the service on 1 May 1954.

Admiral Hogan, a former commanding officer of the U S Naval Medical School and of the U S Naval Hospital Bethesda Md, came to Washington from an assignment as Pacific Fleet Surgeon on the Staff of the Commander in Chief U S Pacific Fleet. Captain Jackson, who became a prisoner of war when Guam fell to the Japanese in 1941 until recently was chief nurse at the U S Naval Hospital Portsmouth Va.

FIRST WOMAN PHYSICIAN IN REGULAR ARMY MEDICAL CORPS IS PROMOTED TO CAPTAIN

Captain Fae M Adams MC USA who on 6 February 1953 became the first woman in history to be commissioned in the Medical Corps of the Regular Army was promoted from a first lieutenant on 6 May 1954 in a ceremony at Walter Reed Army Hospital Washington, D C. where she is a resident physician in obstetrics and gynecology



First Lieutenant Eileen B McAvoy MC USA center congratulates Captain Fae M Adams MC USA following her promotion by Major General Leonard D Hixon, gynecology command sergeant major of Walter Reed Army Medical Center

A 1951 graduate of Women's Medical College in Philadelphia Captain Adams' military service began when she enlisted in the Women's Army Corps in October 1943. She was commissioned a second lieutenant in the Women's Medical Specialist Corps on 10 July 1945 and served 14 months in Okinawa before being separated from the service to enter medical school.

First Lieutenant Eileen B McAvoy MC, USA the second woman to be commissioned in the Medical Corps of the Regular Army is also stationed at Walter Reed Army Hospital where she is a resident in internal medicine. A former Army Nurse Corps officer she was graduated from Baylor University College of Medicine in 1952 and commissioned in the regular service on 29 June 1953.

OFFICIAL DECORATIONS

LEGION OF MERIT

John K. Da Col MC, USA	Henry L. twin, Lt. (jg) (MC) USNR
Arch bald M Eckland Capt. (MC) USN	Gerald A. Mart n Lt. (MC) USN
E gene R Her s Capt. (MC) USN	William S. Ogl Lt. (MC) USNR
Charles L. L dham, Col MC, USA	Fred W. Seymour Col. MC, USA
C. M. L. s nd n Jr Lt. Comdr (MC) USN	H ary J. Tvrdy Col. MC, USAF

BRONZE STAR MEDAL

J m s K Ar ma Capt. MSC, USA	Cha le H. Eaton Comdr (MC) USN
Fra k H Aust Lt. (jg) (MC) USN	J nathan J Eckhart, First Lt. MC, USA
Georg H Bartl tt Maj. MSC, USA	Charl W F in J Lt. (jg) (DC) USNR
Al A. Bas ng t Lt. (jg) (MC) USNR	William J F tt II Lt. (jg) (MC) USNR
Lawr n E Ba zell Capt. DC, USA	V g l H. F m, First Lt. MC, USA
H rman E Be hrman Capt. MSC, USA	Domenic S F rent no Capt. MC, USA
George M. Bell Comdr (MC) USN	Lydon B F tch Jr Lt. (jg) (MC) USNR
Richard E B tly Capt. MSC USA	Martin B Fl g l Capt. MC, USA
J eph A Boardma First Lt. MSC, USA	W nslow G F First Lt. MC, USA
R bert D Boo First Lt. MC, USA	Stanl y H Ft h Maj. MSC, USA
John A Booth Lt. Col. USAF (MC)	Abraham P F edma First Lt. MSC, USA
William A Boys n Capt. MC, USA	Ha ld J Funke CWOHC, USN
J hn S Bradshaw F st Lt. MC, USA	R bert D Gamble Capt. MC, USA
Edward B mm Second Lt. MSC, USA	Cla c G. Gates First Lt. MSC, USA
Albert B B tt Jr First Lt. MC, USA	Ch ter J G bs n First Lt. DC, USA
J ph G B own, Capt. MC, USA	Albert J Gilbert J First Lt. DC, USA
Robert B Brow Capt. (MC) USN	J phine M. G ll Capt. ANC, USA
R bert D B chanan Maj. DC, USA	Edward J Gay First Lt. MC, USA
Ew ll R Burkhalter First Lt. MC, USA	Cha l H. Hamann, First Lt. MSC, USA
Stanl y E. B tl Ca t. MSC, USA	Robert J Harv y Lt. (jg) (MC) USNR
William E Cape First Lt. MC, USA	Ch ter R Hast gs First Lt., MC, USA
George F Catl ff Jr Lt. (MC) USNR	George B H ckl t Capt. MC, USA
R bert E Chambe First Lt. MC, USA	Andrew N H nt chs First Lt. MC, USA
Eug H Chapma Capt. MC, USA	Dani l L. H bst First Lt. MSC, USA
Edd L. Clark, Capt. MC, USA	Arthur L. Hinman, First Lt. DC, USA
Ambr H. Cl m t Fst Lt. MC, USA	George D Hopkins Capt. MC, USA
R h M. C h n Lt. (MC) USN	Ivan R H bbard First Lt. MSC, USA
Da id G Co ll First Lt. USAF (MC)	Erno P I gel Capt. MC, USA
K n. h J Co Lt. (jg) (MC) USNR	R chard B Irv n First Lt. J. C. USA
William C. Da Lt. (jg) (MC) USNR	Ernest K. J mes Lt. DC, USA
Fra k D Bell First Lt. MC, USA	William C. J g First Lt. MSC, USA
J h R D F rg s First Lt. MSC, USA	Donald Kent Lt. (jg) (MC) USNR
William A DeF Lt. Col. MC, USA	H i n H. King Capt. USAF (MC)
Jos ph A D First Lt., MC, USA	Frank H. Klepacki, Fst Lt. DC, USA
William F D ca Capt., DC, USA	Mil J Knapp First Lt. DC, USA
Phill R Dunn Fst Lt. MSC, USA	Arthur L. Kr tchma Capt. MSC, USA

Oak Leaf Cluster

In ad dment to him th t n m f f r of t medal crv w h e b n awarded dec so by t. United Stat Army Navy Air Force s ce the be g n s g f th Kre n c - g ar pul d follow g rec t f th f m ti from ff sal our —Editor

BRONZE STAR MEDAL—Continued

K h F K h l m a	Fir t Lt MC USA	Fl ia J Ragn	Capt USAF (MC)
J m M Law	F t Lt MC, USA	A hur C. Ri ha d J	Capt, MC USA
P osp J L va	ur Fir t Lt MSC, USA	L gh M. R be	Lt (jg) (MC) USNR
J h P L hr Lt.	(jg) (MC) USN	Law R b w	Fir t Lt MSC USA
R L Mag	C pl MC USA	A gust M Sal d	Capt MSC USA
H rry P M k l M,	MC, USA	L y C. S hl h	Lt (MC) USNR
L l yd B M Cab	Capt, MC USA	R be t W S hoed	C pt MC USA
J ph H M F l d	Sec nd Lt, MSC, USA	D l F Sh	Capt DC, USA
J me K M ll F t Lt	MC, USA	R be D Sh rt F t Lt	MSC USA
Ge g R M ll	Lt (jg) (MC) USNR	O D Sm b Lt C l	MSC, USA
W l l i a m W M g m ry	Lt (jg) (MC) USNR	Ha l l S wd M,	ANC, USA
Ha ld G M hm	M, USAF (MC)	V S ll J Lt (jg) (MC)	USNR
N l B r l F t Lt	MC USA	J me H St w	Lt (MC) USN
D l M O T l Lt (jg) (MC)	USNR	P ul E T ha	Capt MC USA
W l r A P h k	Capt MSC USA	J ph G T	F t Lt MC USA
A thur H P k	F t Lt USAF (MSC)	W lt J W l h	Lt Col USAF (DC)
Ka bl W Ph ll p	Capt, ANC, USA	Cha l W W	Capt USAF (MC)
H bert C. Pirkl	Lt (jg) (MC) USNR		

AIR MEDAL

J h A Booth Lt C l	USAF (MC)	Edga L Ol	C l USAF (MC)
J h A N b l	Capt, USAF (MC)		

COMMENDATION RIBBON

F k E A d	M, USAF (MSC)	Dea A G t	Fir t Lt, USAF (MSC)
G T A d	Lt Comdr (MC) USN	J m W G l h	Lt (MC) USNR
R be A B ha	WOJG MSC USA	H me C G ll	Lt (jg) (MC) USNR
K k B dayn	M, MSC USA	G na H Hag	Lt Col MSC USA
Irv g E Belf ld	Fir t Lt DC, USA	H wa d j H d	Fir t Lt MSC, USA
J m H B	Fir t Lt MSC, USA	R be D Ha	Lt (jg) (MC) USNR
J ph B ma	Capt MC USA	H gh B H	Lt (jg) (MC) USNR
E g F Bl k, Lt	(MC) USNR	R lph E Hay	Lt (MC) USN
R be J B h	Fir t Lt MSC, USA	J h H H bb Lt	(jg) (MC) USNR
R be t M B ugh	Lt (MC) USNR	H bert H ll Lt	Col MC USA
G d S B gh	Capt, MSC, USA	L na d E J h	Comdr (DC) USN
W l l i a m C. Bra d	J Lt Comdr (DC) USN	Sta ley L j k f ky Lt	(MC) USNR
S l D Bra	Fir t Lt MC USA	J m F K na	Lt (DC) USN
Ar hur E B w	C L, USAF (DC)	S l m L K th	Fir t Lt MSC, USA
R be T B w	Lt (jg) (MC) USNR	R ndall M K t o	Lt (jg) (MC) USNR
H wa d S B w	J Lt (jg) (MC) USN	R be J Kl h nz Lt	(MC) USN
Edw W B l	Capt MC USA	H nry Kraus	Fir t Lt MC, USA
J h H Cap	Lt (jg) (MC) USNR	R ta l La C mbe	Capt ANC, USA
J ph W Cl ry	Fir t Lt MC, USA	R ha d H La	Lt (jg) (MC) USNR
L yna W C d	Lt (jg) (MC) USNR	L w ll L L h ma	S nd Lt MSC USA
H bert L C	Fir t Lt, MSC USA	J h L h	Capt, MSC USA
Albert B C l J	Lt (jg) (MC) USNR	D ugl L d y Lt C l	MC USA
W l l i a m E D l r y m p l	Capt MSC, USA	H nry L	Lt (jg) (MC) USNR
J m B D bbl	Lt (jg) (MC) USNR	W l l i a m E May	Lt (MC) USNR
J me P D b b ns	Fir t Lt MC USA	J h J M H l	Lt (jg) (DC) USNR
J h A Dod	Fir t Lt, MC USA	Cl B M hl	WOHC, USN
Georg R F r t ll Lt (jg)	(MC) USNR	J me F M mma	Lt (jg) (MC) USNR
F d k J F	J Col USAF (MC)	W nd ll N i h	Comdr (DC) USN
L oy F F nd	Comdr (MC) USN	P tr k F O' C ll Lt	(MC) USNR
K h E G all S cond Lt	MSC USA	L w H Od n, J	Lt Col, USAF (MSC)

REGULAR MEDICAL CORPS OFFICERS CERTIFIED BY SPECIALTY BOARDS

The American Board of Internal Medicine

Founded in 1936, the American Board of Internal Medicine has certified more physicians than any other approved specialty board. On 30 June 1953, a total of 8,404 certificates had been issued of which 128 were received by regular Medical Corps officers of the U S Army, Navy, and Air Force. Subspecialty boards have been authorized in allergy, gastroenterology, cardiovascular disease, and pulmonary diseases.

The following regular officers, according to the respective surgeons general, have been certified in this specialty:

Sa I B Appel *May USA*
Frank H Aust *Capt. USA*
The d r Ba harach *May USA*
William S Bagnall *Lt. Col USA*
Fra k L B r *Lt Col USA*
Charl F B hr n *Rear Adm. USN*
Wilbur C. B r y *Col USA*
Clifford A Be t *Col USA*
Albert A B ederma *Col USA*
R bert E Blo t *Col USA*
D nald T Bo k *May USA*
A beey L Bradfo d *Col USA*
G rg W Cal r *Rear Adm. USN*
George L Calvy *Comdr USN*
R bert O Canada *Comdr USN*
Da d Carmichael Jr *Lt. USN*
H bert H Carr ll *Capt USN*
Robert L Chancey *May USAF*
William L Chapma *Lt. USN*
R bert N Cla s *May USAF*
Edward A Cl *Col USA*
H rbe t W Co o *Col USAF*
Ralph L Co *Col USA*
M rto C. Cr d t r *Capt. USA*
Richard I Cr *Col USA*
Da Cr t *Lt Col USA*
Tra y D C ttl *Comdr USN*
M rrl C. Da po t *Col USA*
M ur c C. D n *Col USA*
St ph n H D acham *Capt USA*
Da d L De t ch *May USA*
Robert B D k rson *Lt. Col USA*

W ren H De n r *Col USA*
Mel ill M Dr k ll *Comdr USN*
William G Dunningt *Lt. Col USA*
Walter M Edwards *Lt Col USA*
W ll f rd Eppas *Capt. USA*
E rl F Evans *Capt USN*
Paul S Fanch r *Col. USA*
Robert B Franklin *Lt. Col USA*
John L. Fr zer *Capt USN*
William S Ge rg *Col. USA*
Hor e C. G bs n *Col. USA*
J mes O Gillesp *Brig Gen. USA*
J ha E Go man *Comdr USN*
Edwi M. Goy tt *Col USA*
Dell M. Gr y *May USA*
Chri tua Gr nbe k J *Lt Col USA*
Ma shall E Gr r J *Col. USAF*
William R Haas *Col. USAF*
P l Hay s *Col USA*
Al n R H gg ns *Capt USN*
Robert J Hoagla d *Col. USA*
Arch A H Hman *Lt. Col USAF*
Fred r c J Hugh s Jr *Lt. Col. USA*
Robert C. H r *Lt. Col. USA*
Thoma W I m *Lt. Col USA*
Thurl E J tt tt *Comdr USN*
Edw rd J J rus wsk *Comdr USN*
Brano J tt msks *Col USA*
E g n v Jobe *Capt. USN*
Bruc W Johns n *Lt Col USAF*

INTERNAL MEDICINE—Continued

R h a d P J h Col USA	L J P p Comdr USN
H r a L J Comdr USN	G g M P w l l C I USA
Emm t L K h o e Col USA	W l l m D P Col USAF
Edw d C. Ke y Capt USN	Fra i W P Col USA
W l l i a m W A l k Capt. USN	Ryl A R d k C I USA
K l M L a Comdr USN	H l d E R a t c l l f Lt C I USA
A h u r L. Lawl Capt USN	H r v y E R C m d USN
Cha l L L d b a m Col USA	Edw d A R k t t Lt Col USA
Julia L Capt USN	Sam l H S a d f Lt C I USA
Do O L y Col USA	J h R S e l C m d USN
J h B M a G g Comdr USN	Chr p h C. Shaw Capt. USN
Th m a W M a t g l y C L USA	J h A S h d y M j USA
M E M D w l l Maj USA	D l J S h h a Col USA
Edw d P M L a y Capt USN	J k C S h d Lt Col USAF
J m A M L a g h l Lt Comdr USN	J m B S h l C p t USN
Jul J M N y Lt C I USA	J h K S p t z n a g l Maj USA
U h o R M k a n g a C I USA	W l l m S Lt C I USA
C L M l b u r C I USA	J h T B S d Col USA
W l H M u r n d J C L USA	B i m H S l l J Lt Col USA
F d H M w y C L USA	Ca l W T m p l C L USA
R b e t K N Lt Comdr USN	W l l m G T h a l m a Lt C I USA
R b e t S h l Col USA	J m L T b C I USAF
L l y d R N w h Capt USN	J p h R V v a Lt Col USA
Byr A N h l Lt Col USA	R l p h V l k Comdr USN
I w L V N m a Capt USN	D l J W l g Col USA
L J N m a l l Col USA	W l d J W l k Lt Col USA
H r y C. O a d Capt USN	J h H W d Capt USN
J m A O r b Lt Col USA	W l l m M W b b Lt Col USA
J h M P k a d Lt USN	W l l m H W b r o o k M j USAF
E d d y D P l m Lt C I USA	M j S W h B g G n USAF
R l p h C. P r k Capt USN	J m A W Lt C I USA
L F P m l y J Lt Col USA	W l l i a m D W l l C I USA
R f J P e a Comdr USN	Cha l T Y g C I USA
W s l e y L P e t o n Jt Capt USAF	A t Z i k m n d Capt USN
By E P l l k C L USA	

DEATHS

EMENS Eth l Glad y F a t L t e a n t A N C U S A R W l e s R e e d A m y H o
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N u r s e s 1934 r e d e r d e t e c t e d t y 26 N o v e m b e r 1943 d d 23 A p r i l
1954 g 43 W h g t f h m a g i o p i c y t m a f t h e c a u s e

MANNING J e p h C r o c k e t C p t a i n U S A F R (M C) U S A u r F o H o s p i t a l
T i k A s F c B O k l g r a d u a t e d f r o m U n i v e r s i t y o f T e n n e s s e e
C o l l e g e o f M e d i c i n e M e m p h i s T e n n e s s e e 1942 d d t e c t e d t y 29
M a r c h 1953 d d 3 A p r i l 1954 g 37 a t t h e U S A F H o s p i t a l
S h e p p a r d A u r F o B T e o f b r a n c h g e n e r a l m a j o r

NEUSTEIN Dudl y H o w d C p t a i n M C U S A R U S A m y H o s p i t a l F e t
C a m p b e l l K y g r a d u a t e d f r o m C h i c a g o M e d i c a l S c h o o l 1949 d d e d t
e c t e d t y i n O c t o b e r 1952 d d 27 D e c e m b e r 1953 g e 32 o f 1
e t d n a u t m b l e c c d a t n e C h i c a g o I l l

A MESSAGE FROM THE A M A

On 15 July 1952 the Council on National Emergency Medical Service of the American Medical Association initiated a continuing opinion survey of physicians being released from active military service. The information obtained is useful to the Council and the medical profession in connection with the utilization of medical personnel by the armed services. During the first year of the survey, a total of 3,948 completed questionnaires were returned, which represents about a 70 percent response.

The questionnaire used during the first year of the survey contained 37 questions and was designed to show (1) general information about the physician such as age, education, et cetera; (2) the extent of his military training, his military department, rank, current military status, and special military courses received; (3) the type of work performed while in service, the efficiency of utilization, the percentage of time spent on the care of military personnel, dependents, and others; (4) staffing conditions for physicians and allied health personnel; and (5) comments and suggestions not only with respect to the armed services but also concerning the ways in which organized medicine can be of greater assistance to the physician in uniform.

A brief summary of some of the information obtained which is of general interest to physicians in service is presented in this issue. Additional information will be presented in the July issue of the *Journal*.

Time spent in service. The survey shows that the average total time spent in the service by those responding was 24.7 months. The average tour of duty in the United States was 7.6 months, and the average tour of foreign duty was 17.1 months.

Age distribution by service. The largest age group, at time of separation, covered the ages 30 to 34; the second largest group covered the ages 25 to 29. By service, the 30- to 34-year old group was the largest in the Army and Air Force, while the 25 to 29 year old group was largest in the Navy. Likewise, there were more in the "40 and over" group in the Army and Air Force than in the Navy.

Physicians' evaluation of staffing conditions. Of those responding, about 19 percent in the Army thought there was over

staffing 29 percent that there was understaffing and 52 percent thought that the staffing was adequate. In the Navy 31 percent thought there was overstaffing 16 percent that there was understaffing and 53 percent that the staffing was adequate. In the Air Force 42 percent thought there was overstaffing 17 percent, that there was understaffing and 41 percent that the staffing was adequate. In terms of totals for all the armed services 29 percent thought there was overstaffing 20 percent that there was understaffing and 51 percent thought the staffing was adequate.

Distribution of physicians by rank at time of discharge The survey indicates that the majority of physicians in all three services at time of separation held the rank of captain in the Army and Air Force or lieutenant in the Navy. It is significant to note that a larger percentage of the lowest rank is found in the Navy (lieutenant junior grade) than in the other services and there is a correspondingly lower percentage of grades above this level in the Navy than in the other military departments. The percentage of captains in the Air Force was much higher than the comparable grade in the other services.

Number of years since graduation The survey showed that by far the majority of those responding (78.8 percent) graduated from medical school between the years 1945 and 1949, the second largest group (9.6 percent) graduated between 1940 and 1944 and the third largest group (7.2 percent) graduated in 1950 and later. A few (4.4 percent) graduated before 1940.

Years of internship and residency A majority of those responding (88.7 percent) had one year of internship training while 26.9 percent had no residency training 27.6 percent had one year of residency 19.6 percent had two years of residency and 15.3 percent had three years.

Occupation at time of entering service A question was asked designed to ascertain the type of occupation in which the physician was engaged at the time of his entrance on active duty. The answers show that a majority were in residency training at the time of beginning service and the second largest group was in internship. The third largest group was engaged in general practice and the fourth largest group was engaged in a full time specialty practice. The remainder were in other occupations such as industrial practice and government service.

Number of physicians holding board certificates A total of 270 of those who responded to the questionnaire held board certificates. Of these 144 were in the Army 69 in the Navy and 57 were in the Air Force. Specialties covered a number of different fields. The greatest number of physicians were cer

tified in pediatrics, and the second and third largest in internal medicine and surgery, respectively. By service a total of 10.5 percent of those responding in the Army, 4.1 percent of those in the Navy, and 6.7 percent of those in the Air Force had certificates. A total of 6.9 percent of physicians in the three services had specialty board certificates.

LETTER TO THE EDITOR

FISH POISONING IN THE PACIFIC

To the Editor—The recent excellent report of Halstead and Lively in the February issue of the *Journal* recalls the only case of fish poisoning I have seen—one at the Kwajalein Naval Base in the Marshall Islands in July 1948 while on a tour of the Far East Command as consultant in surgery for the Surgeon General of the Army. During a delay of 12 hours at Kwajalein Dr. George Griffith and I were invited by a naval medical officer to see a case of fish poisoning.

Several sailors while fishing late in the afternoon had caught a yellowtail or yellowjack—a variety of Pacific tuna which is ordinarily not poisonous—and they ate it for supper. All became ill and had been brought to the sick bay not long before we saw them. The one seriously ill patient was apprehensive and felt numb. He had a marked positive Chvostek sign. A light tap on the cheek would throw his face into a violent spasm. The tip of his tongue was so sensitive that when he touched it to his teeth he felt as if he had received an electric shock in his tongue. A tongue depressor produced the same effect. He had a marked carpopedal spasm. There was a loss of superficial skin sensation below the neck to a pin prick but deep (muscle) sensation was present. The superficial and deep reflexes were absent below the neck. The diaphragm moved normally but the intercostal muscles were weak.

Dr. Griffith believed that the patient's signs and symptoms especially the carpopedal spasm and positive Chvostek sign indicated a lack of calcium in his blood. He thought that possibly the fish poison had caused the blood calcium to be bound in the tissues and not available in the circulating blood. The patient was given 2 grams of calcium gluconate intravenously and within 10 minutes his symptoms had entirely disappeared. Because we departed soon after I do not know whether or not he had a recurrence of his symptoms and if so whether or not additional calcium gluconate intravenously would have helped him.

AMOS R. KOONTZ, M.D.
1014 St. Paul Street
Baltimore 2, Md.

PUBLICATIONS BY OFFICERS OF THE MEDICAL SERVICES

Agg l P M Wh S G Maj USAF (MC) d Spa T H De h mo-
ph l pl ma hr mbopl f B d f cy pl m h mbopl mp
(PTC) d f cy Ch ma d h m ph l B Blood 9 246-253 Ma 1954

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Ar hambe l C P Cap (MC) USN Ma mala l h py ra ur g
f om k J A. M. A. 154 1411 1415 Apr 24 1954

Ba hna K P L Comd (MC) USN F C. G L (MC) USNR J k M A
L (ig) (MC) USNR Sh h P H L (MC) USNR nd Oa d H C. Cap (MC) USN
Rad on g ld ns ll d rape d lly po f ca Am Int M d. 40 811 819
Apr 1954

Bl k W J Cap MC USA nd L S J Col MC USA M l pl be g
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Br ga D L L (ig) (MSC) USNR Mod f ca f h ma pp p f
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Bow C. T L Col MC USA F ud nd oca Mil Surgeon 114 285 286
Ap 1954

Caldw ll J M. Col MC USA P p y b try f h phy Ill no M J
104 236-241 Oc 1953 b ra Am Pr ct & Dig 1 T t 5 165 Ma 1954

Cline H L Cap MC USA H usew h J H Cap MC USA d P F W
Cap MC, USA Or ry f m m p my ulf h py f p lmo ry
be cul udy f 100 pa tr d gh m h A. M. A. Ar h Otolaryng 59
100-103 J 1954

Dv k S Cap MC, USA M h loma f pe um porr wh b
fl d ta d hyalur d Am Int Med. 40 809-811 Ap 1954

F n F R Col MSC USNR Ame n Pha ma l A ia M l
Surgeo 114 284 285 Apr 1954

Gl G F Capt USAF (DC) Sw y W T nd S hoo L C. Eff f
pr b g h mal pa f l gyp m me J Am Dent As oc
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Goldbe g H Cap DC USA nd Goldhabe P F L DC USA H d tary
nal polypos w h l p gme ta (f gh y d me) Oral Surg 7 378 382
Ap 1954

Gr R N Comd (MC) USN F l urg y K M l Surg on 114 266-
269 Ap 1954

K J H L Col MC USA Ultra gy d j manag me f
rad ul nd ml f d pa n. Am J Phy M d. 33 61 65 F b 1954

Kyl L H M y W H Maj MC USA nd F ma M E L C l MSC, USA
Sudy f me ha m f bo d bypoph pha m gly osur mal
J Cl n Endocr nol 14 365 377 Ap 1954

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BOOK REVIEWS

GLOBAL EPIDEMIOLOGY *A Geography of Disease* by *Donald Sattar* *V. I. M. III*
The National Middle East by James S. Simmons *M. D. Ph. D.*
D. P. H. Baghdad *G. I. USA* *R. T. d. Tom F. W. b. y.* *M. D.*
Dr. P. H. Col. I. MC. USA *G. y. d. W. A. d.* *M. D.* *Dr. P. H.*
H. rold M. la bla H. k. M. D. *357 p. g.* *ill. t. t. d. J. B. L. pp.* *tt.*
Co. Ph. l. d. lph. P. *1954* *Pr. ce \$12*

This is the third reference volume by the same authors devoted to problems of health, disease, and sanitary conditions in a relatively little known area of the modern world. The geography and climate of each country are discussed briefly and considerable discussion is devoted to its socioeconomic conditions including population, vital statistics, wealth, food, and housing and to the description of its environmental and sanitary factors. These factors in great measure dictate the types of health organizations and medical facilities that are necessary in each country. The discussions of disease incidences are arranged by systems, but the remarkable fact is that there is so little medical knowledge of the Middle Eastern countries.

Improvement in orienting the reader has been made over the previous volume by the use of a map of the country concerned at the beginning of each chapter. Relief maps would have been helpful and a vivid description of the height of mountains, river courses, and other important terrain features in a clearer manner. The multilingual bibliography at the end of each chapter is of value to persons desiring more detail in any particular. There is a useful index which lists the diseases with the page references by country.

To those physicians, economists, and politicians responsible for the health and welfare of their own countries, and to those who must assist the more backward areas in these matters, this book and the entire series will serve as a basic text.

—GOTTLIEB L. ORTH *Col. MC. USA*

SPACE TRAVEL by *K. T. W. G. I. d. d. A. T. ny. M. K.* *ch. 205 p. g.*
ill. t. t. d. by ph. t. g. t. ph. d. d. w. g. *Dr. w. g. by J. W. W. d. nd.*
R. A. S. m. t. b. Ph. l. ph. l. L. b. r. y. N. w. Y. k. N. Y. *1953* *P. \$4.75*

This is a popular history of the development of rocket combined with considerable imaginative speculation on the possibility of man's flight to space. Written by two English authors, one of whom is secretary of the British Interplanetary Society, the book outlines in detail the early work of Goddard in this country and of Oberth in Germany and his student, von Braun (who) was largely responsible for the V-2 long

range rocket. From the earlier factual chapters the authors proceed on the assumption that space flight has become a reality and take the reader on an interplanetary project which probably will have its beginning on a remote island somewhere in the Pacific.

A mixture of science and fiction this small volume is interesting reading for the curious layman who desires a gentleman's knowledge of a vast and complex scientific field. Unfortunately the important contributions of aviation medicine to flight beyond the stratosphere are limited to a brief description of the U S Navy's so called space suit. Henry's work with mice under zero gravity conditions and a discussion of the various human centrifuges that have been constructed. No mention is made of the significant contributions of the Habers, Strughold and Buettner at the U S Air Force School of Aviation Medicine. The inclusion of numerous photographs and drawings adds to the volume's attractiveness but the bibliography and index are limited. Obviously the authors have tried imaginatively to scale the high wall of security classification which encompasses all important research and development in this field — ROBERT J BENFORD Col USAF(MC)

THE OFFICER'S GUIDE 20th edition A Ready Reference on Customs and Correct Procedures Which Pertain to Commissioned Officers of the United States Army 569 pages illustrated The Military Service Publishing Co Harrisburg Pa 1954 Price \$4

This book with a new edition printed almost yearly is a reliable although not official source of information for Army officers and their families. This edition includes the usual subject matter which has been brought up to date. A list of synonyms useful in preparing efficiency reports has been added. An explanation of the recent survivor's benefit law is contained in the chapter on life insurance analysis and this chapter alone is worth the price of the book.

The text is easy to read well indexed and is a valuable reference book for all Army officers —PATRICK L McSHANE Col MC USA

SURGICAL PATHOLOGY by Peter A Hebut M D 2d edition 893 pages thoroughly revised with 528 illustrations Lea & Febige Philadelphia Pa 1954 Price \$14

The author has improved an already excellent text in this second edition. The material covers all the major surgical specialties and brief descriptions of the embryology anatomy and histology of each system are given. The reviewer was delighted to find newer ideas from current literature throughout this truly up-to-date book. The photographs are of excellent quality and well selected. This edition includes 124 new illustrations a new chapter on the adrenal glands and a chapter by Dr Bernard J Alpers on the central nervous system.

The book will be valuable to surgical pathologists and is highly recommended for surgeons preparing for surgical board certifying examinations —WILLIAM O UNIKER M D

NUCLEAR PHYSICS by W H b g 225 p ges Il tr t d Ph l ph cal
L br ry N w Y k N Y 1953 Pr \$4.75

This volume by Professor Heisenberg is an interesting addition to the publications in the field of nuclear physics however it will not be of general interest to the majority of physicians. In the preface the author states his intention of writing a book that will serve as an introduction to nuclear physics but unfortunately he does not fully manage to attain this objective. His work is too advanced for the beginner who might be expected to obtain the most from it and too elementary to retain the interest of a person trained in this field.

The first chapter on the history of the atomic theory is very readable but the last chapter which gives details of the status of atomic research in Germany immediately before and during World War II will perhaps be of most general interest. The general outline proceeding from the history of the subject through the basic principles of radioactivity and nuclear forces to the practical application of these principles in the various sciences is very commendable.

This volume is an interesting altogether readable book which while it does not go too deeply into the subject of nuclear physics yet demand a certain amount of thoughtful consideration on the part of the reader — LOUIS E. BROWNING Lt Col MC USA

PHARMACOLOGY by J H G ddum, Sc D 4th ed t on O f rd M d l P b l u ns 562 p g illustr ted O f d U rs ty P s N w Y k N Y 1953

As stated in the preface to the first edition this textbook of pharmacology is intended to be used by medical students at a stage in their education before general principles become obscured by a mass of practical details but may also interest others. Experimental methods used to develop many new therapeutic drugs some of which are potentially dangerous are discussed so physicians will have a knowledge of the evidence justifying a trial for new drugs.

This edition has been completely revised to include the newer therapeutically important drugs. The main additions and alterations concern the anterior pituitary gland products synthetic analgesics the blockade of autonomic ganglia and neuromuscular junctions vitamin B₁₂ nuclear poisons and antibiotics. The material is well organized with drugs grouped largely on a basis of their site of action and therapeutic activity and indexed with entries for both drugs and diseases. The actions indications toxic effects dosages and methods of administration of the drugs are described as well as experimental procedures used in testing new drugs.

This is an excellent pharmacology text for the purpose intended. Charts photographs and tables are extensively used but the book is lacking in sufficient detailed information to be of value as a reference text. — HENRY D. ROTH Lt Col MSC USA

HANDBOOK OF DIFFERENTIAL DIAGNOSIS by *Harold Thomas Hyman M D*
716 pages J B Lippincott Co Philadelphia Pa 1933 Price \$6 75

In this handbook the author lists possible causes for diseased states encountered in medical practice and gives for each in telegraphic language a pathognomonic or suggestive symptom sign laboratory data and indicated therapeutic tests The book begins with an index of 1585 signs and symptoms directing the reader to one of the 232 divisions of differential diagnosis alphabetically arranged

The cataloging of causative possibilities for the many abnormalities listed is like an encyclopedic index and is disappointing in differential diagnosis The material more nearly resembles a notebook with only a word or phrase concerning the condition in question There are many references to charts and additional remarks concerning the disease or causative agent in question which are considered inadequate There is no discussion or indication of the more common conditions that should be considered in preference to the extremely rare ones The advice concerning the therapeutic response is often faulty The reader is advised to observe the therapeutic response to ACTH or cortisone when their use might not be the proper treatment

Because of inadequate discussion and inappropriate suggestions for therapeutic trials this volume would be of little value for the student or physician other than to list the many conditions that cause signs or symptoms of disease —DOSSO LYNN Col MC USA

AN ATLAS OF PELVIC OPERATIONS by *Langdon Pa son M D* and *Howard Ulf Id M D* Illustrated by *Mildred B Coddington A B M A* Surgical Artist Department of Surgery Harvard Medical School and Peter Bent Brigham Hospital Boston Mass 231 pages W B Saunders Co Philadelphia Pa 1933

This volume is the first published atlas of surgical operations of the pelvis from the gynecologist's point of view and its purpose the teaching of the technical details of pelvic surgery by means of illustration has been ably accomplished Text material is limited to points of technique and helpful hints regarding safe simple methods for coping with trouble areas in operation of the female pelvis as explanatory supplement to the clear and detailed illustrations Simplicity and clarity is maintained by presenting text and illustrations on the same page Modifications of basic technic are illustrated to explain common variations or complications For example in the case of total hysterectomy the procedure is prefaced by an explanatory section on total abdominal hysterectomy then illustrated in logical stepwise fashion and finally by the procedures and steps followed when hysterectomy is accompanied by removal of adnexal structures complicated by additional problems of stress incontinence as handled from above or complicated by cervical fibroid with displacement of the ureter or by inflammatory fixation of the pelvic viscera and so forth

The atlas is divided into three sections namely abdominal operations vaginal and perineal operations and operations for malignant disease. The first section lists conservative operations of the uterus and anexal structures including uterine suspension presacral neurectomy wedge resection and exploratory incision of the ovary and sterilization and plastic procedures on the tube and further treats all procedures involving the intestinal and urinary tracts which the gynecologist may inadvertently encounter. The vaginal and perineal section contains the complete repertoire of vaginal plastic procedures combined abdominal and vaginal procedures the repair of fistulas and the various minor procedures involving the cervix and vulva. Finally the section on operations for malignant disease includes the more radical procedure of Wertheim hysterectomy and pelvic lymphadenectomy combined abdominal and perineal resection of the rectum radical vulvectomy superficial and radical groin dissection and extraperitoneal lymphadenectomy.

This atlas will prove most useful for student gynecologists as well as for those in general practice and general surgery who encounter pelvic surgery and desire a clear and concise presentation of proved methods in developing their own skill and technic —JOHNA PEASE *Comdr (MC) USN*

THE CHILD HIS PARENTS AND THE NURSE by F I G B I & R N
M A 440 p ge J B L pp tt Co Phil d lph P 1954 P \$5

This book was written primarily to deepen nurses and parents understanding of children and to make it possible for them to obtain increased pleasure in their experiences with them. It presents recent concepts and trends in maternity and pediatric nursing accepted by other allied professions. The increasing importance of the nurse in the field of preventive mental health is stressed and positive suggestions in nursing education are offered.

The book is divided into flexible growth phases the needs of the expectant parents are met by their proper guidance. Differing from the usual text in pediatric nursing it is centered on the patient and family rather than on disease and procedure. The emphasis is on improvement of interpersonal relationships to meet the needs of the patient and the nurse.

There are many authoritative quotations and illustrative examples from various fields of human development and behavior. Up-to-date reference material is presented at the end of each chapter. The questions to guide observations section stimulates thinking and should prove an incentive toward self study.

This book can be used as a reference by all nurses. It should prove of particular interest to nurses in advanced fields of pediatric obstetrics public health and hospital administration.

—LEONA WEINER F I L I A N C USA

CLINICAL ROENTGENOLOGY Volume I Developmental and Systemic Conditions and Local Lesions in the Extremities by *Alfred A. de Lorimier* M D *Henry G. Moebring* M D and *John R. Hannan*, M. D 495 pages 782 illustrations Charles C Thomas Publisher Springfield Ill 1953 Price \$18 50

This is the first of four volumes to be published as a major reference work on diagnostic roentgenology by three authors all of whom were formerly assigned to teaching posts at the Army Medical School in Washington D C and the Army Roentgenology School in Memphis Tenn from which much of the material was obtained They state that it is their intention to simplify the problem of identifying different disorders They begin by reviewing the underlying basic principles then proceed to a consideration of the characteristic roentgenogram a brief summary of clinical and laboratory findings and finally the differential diagnosis

The conditions covered in this volume are those affecting the extremities both local and systemic The material is grouped under the following headings developmental malformations traumatic lesions metabolic disorders endocrinopathies infections neoplasms blood dyscrasias miscellaneous arthropathies and a short discussion of venography and sinus tract injections

The book has two outstanding features First the authors have eliminated the verbosity found in so many texts the language is clear and concise Second there are a large number of reproductions of roentgenograms which seems essential in a book devoted to this subject The reproductions are in a readable form both as to size and detail The sizable print and quality paper are additional features of note A list of references follows the discussion of each subject and the material is well indexed

This book will be of considerable interest as a general reference work both to the student and to all physicians concerned with x ray diagnosis — *CLEMENT D. BURROUGHS* *Comd (MC) USN*

REVIEW OF PHYSIOLOGICAL CHEMISTRY by *Harold A. Harper* Ph D 4th edition 328 pages illustrated Lange Medical Publications University Medical Publisher Los Altos Calif 1953 Price \$4

This new edition is an excellent review of the fundamentals of physiologic chemistry which emphasizes the accepted concepts of the subject It is a review and must be supplemented by standard texts monographs and journals when more complete information is desired

The author has retained in the first chapter a simple presentation of the principles of general and physical chemistry which are frequently forgotten by those not engaged in teaching or research in this field This is followed by chapters on the chemistry of the carbohydrates lipids proteins nucleoproteins and nucleic acids vitamins and

enzymes. Separate chapters are devoted to biologic oxidations, the blood, lymph and cerebrospinal fluid, the chemistry of respiration, digestion and absorption, detoxication, metabolism of carbohydrates, fats, proteins, nucleic acids and their derivatives, functions and tests of the liver, the kidney and the urine, water and mineral metabolism, the chemistry and functions of the hormones, calorimetry and the elements of nutrition and chemistry of the tissues.

There are many excellent charts, graphs, illustrations and tables which aid in understanding the various physiologic mechanisms. The book will be helpful to physicians and others desiring a quick review of biochemistry. — ERNEST M. PARROTT, Major, MSC, USA.

UROLOGICAL PRACTICE by R. G. H. B. D. and H. J. L. H. D. L. Y.
 MD 494 page 11 tract d Th C V M by Co S L M 1954
 P \$12.50

The authors have accomplished their objective of providing a quick reference to a general practitioner in the diagnosis and treatment of common urogenital diseases.

The book has two parts. In Part I, 70 pages are devoted to an alphabetical listing of all symptoms and signs of urogenital disease and related conditions. These items are defined or described and subheadings are included in outline form which enumerate the causes or conditions responsible for the symptoms or findings. References to later chapters in the book are usually given. The subheadings contain brief but pertinent information helpful in the diagnosis of these lesions. The symptomatic treatment of urogenital disorders is listed under the symptoms and findings.

Part II includes the subject matter usually found in urologic texts with the addition of chapters on differential diagnosis of abdominal pain, infertility in women and nonsurgical diseases of the kidney. This portion of the book is clearly and simply presented but adequate detail is given for common conditions. The more rare lesions are briefly discussed. The authors state that early diagnosis of testicular tumors with prompt orchiectomy offers the best hope of cure. They mention that the radical operation involving retroperitoneal lymph node removal is being done but do not give results. Kimbrough in 1951 demonstrated statistically in five year survival rate the superiority of the radical operation over simple orchectomy by about 25 percent.

A brief discussion of the medicolegal status of sterilization operations (vasectomy or vasoligation) is commendable because this subject is usually not included in urologic texts. Photographs of roentgenograms clearly showing the structures and abnormalities described are of superb quality throughout. The illustrations as well as the index are good but bibliography is not included.

—SIDNEY MILLER, Lt. Col., MC, USA.

THE BALLISTOCARDIOGRAM A Dynamic Record of the Heart Beat by John R. Braunstein, M.D. Ph.D. 84 pages illustrated Charles C. Thomas Publisher Springfield Ill 1953 Price \$3

The author of this short monograph wisely states in his preface that the time is not yet ripe for a text on the subject of ballistocardiography. He has fulfilled a most important function however for the student or specialist who is not familiar with this particular field, by outlining the history description of instruments physics and mathematics of this system of analyzing cardiovascular activity. The descriptive chapters are clear and should be easily understood by the average medical reader. The mathematical aspects of the subject are not dispersed in the text in such a way as to confuse the average reader but are concentrated in the appendix where they are readily available.

This handy sized booklet is definitely recommended for all those planning to use the ballistocardiograph or read the literature on ballistocardiography. —RALPH C. PARKER Jr. Capt (MC) USN

THE CHEST A Handbook of Roentgen Diagnosis by Leo G. Rigle M.D. 2d edition 380 pages illustrated The Year Book Publishers Inc Chicago Ill 1954 Price \$8

This small handbook of roentgen diagnosis in chest diseases contains an immense amount of information presented in the well organized and authoritative style of an experienced and widely acclaimed teacher of radiology. The author has skillfully and successfully employed the atlas method to achieve his purpose which is to provide a foundation of knowledge and a guide for the analysis of any roentgenogram of the chest.

The book is divided in three sections. The first contains an introduction and outline of methods of roentgen examination of the chest. The second section consists of a concise description of the normal chest with its variations and a discussion of the physiology of the respiratory tract. The final section concerns pathologic conditions and contains excellent radiographic illustrations with appropriate interpretations.

The most notable revisions in this edition concern advances in the details of the methods of roentgen examinations and diagnostic signs. Newer terminology numerical designation of the bronchi advanced techniques in bronchography some recent material regarding the early diagnosis of lung tumors and new illustrations have been added. This edition will not necessarily induce owners of the first edition to discard their copies in its favor because as the author admits "there have been no sensational discoveries in roentgen diagnosis of the chest during the past five years. Nevertheless either or both editions should find an appropriate place in the library of any student specialist or institution of teaching in the field of radiology.

—KENNETH L. McEWEN Maj, MC USA

THE DIGESTIVE TRACT IN ROENTGENOLOGY V lum I d II by Ja b
B k r M D 2d dit o V lum I 544 page V l me II 658
pag 1 534 II tratio 897 figur J B L pp c tt C Ph la
d lph P 1953 P \$30 t

This two volume book is a complete treatise on the roentgenologic demonstrations of the normal gastrointestinal tract its malformations and diseases. Although the author has for sake of completeness included rare conditions he has placed major emphasis on the lesions more commonly seen by internist gastroenterologists and radiologists in their practice. All the roentgenologic material included was proved by operation or autopsy and the correlation of the essential clinical features with the roentgenographic and pathologic findings was stressed throughout.

This expanded new edition published six years after the first edition includes a large amount of new material. The division of the material into two volumes necessitated by the increase in knowledge has considerably enhanced the book's usefulness. Volume I includes an interesting history of the study of the alimentary tract by roentgenoscopic and roentgenographic methods. The author then discusses the hypopharynx esophagus stomach and duodenum their anomalies diseases and methods of examining them roentgenologically. In Volume II the small intestine large intestine diaphragm gallbladder and bile ducts spleen liver and pancreas are similarly treated. The anatomy physiology technique of examination and roentgen findings in each division of the gastrointestinal system are thoroughly and clearly described. The illustrations of great importance in books on radiology supplement excellently the described roentgenographic images.

This book will prove of value to all physicians who are interested in the study of the gastrointestinal tract and to teachers of radiology and gastroenterology — HAROLD I AMORY Col MC USA

HYPERTENSIVE DISEASES Ca d Co l by He ry A S b oed
M D F A C P 610 pag 164 II t d 3 l d pl t
L & F t g Ph Lad lph P 1953 P \$10

This textbook is a broad review of the problems presented by hypertensive diseases. It is an interestingly written volume in which the stimulating thoughts of the author make factual presentation of theory statistic diagnosis and therapy far better reading than a treatise. The book serves both as a teaching text and as a reference guide for beginning research. Frequent clinical observations and use of illustrative case records emphasize the characteristics of the various hypertensive disease entities.

Four chapters by other authors on certain causative factors nitrogen compounds hormonal factors and pheochromocytoma are included. There are extensive chapters on diagnosis prognosis and therapy. The author frequently expresses his positive opinion but when there is

room for debate he stimulates the reader's desire for study and investigation. The ultimate aim is complete understanding (of hypertension) leading to prevention.

The type, paper and binding are excellent. Diagrams and graphic charts are abundant and sharply delineated. A bibliography follows each chapter and a detailed author's index and subject index close the text. — WILLIAM W. KIRK, *Capt (MC) USN*

PHYSIOLOGICAL CARDIOLOGY by Arthur Ruskin, M.D. Edited by Robert F. Pitts, M.D. 370 pages, illustrated. Charles C. Thomas, Publisher, Springfield, Ill. 1953. Price \$8.

In this monograph the author achieves in admirable manner his objective of successfully relating experimental and clinical research in basic sciences to clinical cardiology. When pathologic anatomy, biochemistry and pharmacology among others are germane to a particular subject, they are skillfully integrated with the main theme. Technical matters are concisely presented in an understandable manner. One of the most gratifying features of this book is the facility with which the author is able to orient the reader toward the practical application of complex physiologic knowledge.

The subject matter covered in each chapter follows a similar plan. A general introduction embodying brief causative and pathogenetic considerations is followed by a detailed discussion of the altered cardiovascular function. The clinicopathologic features are integrated with the pathophysiologic consequences of the particular disease in an excellent manner. Therapeutic implications are well correlated with these discussions and provide a rational basis for management. The several chapters are well balanced and space is given proportionate to the importance of the subject. The controversy of forward failure versus backward failure is surveyed adequately but not belabored. The brief commentary on refractory congestive heart failure could be profitably amplified. In addition to excellent discussions on the common cardiovascular diseases, informative chapters on the heart in nephritis, hypotensive cardiovascular syndromes, cor pulmonale, functional cardiovascular syndromes and pericardial compression are included. The one on endocrine and metabolic syndromes which includes discussions regarding the cardiovascular alterations associated with pregnancy, obesity and starvation is particularly noteworthy.

The excellent index is carefully compiled and the references, while not exhaustive, are well chosen. This monograph, though not intended as a complete cardiology text, effectively complements existing standard books on this subject and will constitute a notable addition to the bookshelf of any internist, particularly those interested in cardiovascular disease. — JAMES A. ORBISON, *Lt Col MC USA*

PATHOLOGY by W A D A d M D 1 393 page with 1 241 ill str
 ns d 10 1 pl t 2d ed Th C V M by C S Lo
 M 1953 Pr \$16

In the second edition of this textbook of path l gy the editor as be fore has collabo ated with 32 outstanding pathologists each an uthor ity on the subject of his p rticular chapter The auth rs ar ubst ntially the same although one has been deleted and two new ones added Sub stitution of the double column for the single column permits greater reading ease and s the only change in format

The rrangement of the book s contents has been altered only slightly nd only one substitution has been made among the original 10 color plates howe er many of the black and white illustration have been re placed and 58 added bringing the total to 1 241 These are for the most part excellent The number of references at the end of som chapters i voluminous and in one case totals 389

Revisions of the material in this edit on are minimal and are con fined mainly to details of recently acqu red medical knowledge Some subjects such as the effects of ACTH and cortisone have been broad ened and others such the discuss on of retrolent l fibroplasia have been added Some have been shortened for the sake of balance in ac cordance with present-day trends of dise se processes There is no reference to epidemic hemorrhagic fever though perhaps it was omitted because it is not endemic in this cou try As in the first edit on relative prominence is given to effects of r diation trop cal diseases and path ology of the skin skeletal and nervous systems

As a standard comprehensive p to-date textbook for both und r graduates and graduates in medicine this book is highly recommended The objecti e of the original edit on to provid single volume text on pathology has been adhered to and the work remains o e of the most comprehensi e and author tative of its kind

—WILLIAM M SILLIPIANT Capt (MC) USN

HISTOLOGY by A th W th H m M B F R S C 2d d t 866 page
 518 f gur mbe lud g 7 pl c l J B L pp n tt Co
 Ph l d lph P p bl h 1953 P \$10

Under tandability was the basic concept behind the planning of the original ed tion of th s widely acclaimed textbook of histology The difficulties f three-dimens onal visualization were con sidered the common artif cts were explained and histologic structure was cor rel ted with the other basic medical sciences as well as with the prac tice of medicine itself Special emphasis was given to those phases of hist logy rel ted to degenerativ disea es of the heart and arteries to cancer to burns nd skin grafting and to endocrinology

The new econd edition retains ll the excellent features of the original and embodies the str king dvances made in hi tology in recent ye rs Numerous sections have been rewritten notably those dealing

with cells intercellular substances bone nervous tissue the liver the kidneys and the adrenal cortex There are new section on the impulse conducting system of the heart the structure of lymphatic the structure and growth of lung alveoli and many other fields in which advances have been made

The coverage is reasonably complete Although the material is presented in relatively simple form for the use of medical and dental students the more advanced reader can find references for additional information on almost any topic Extensive and up-to-date bibliographies follow 28 of the 30 chapters The 518 illustrations 73 more than in the original edition include many especially good electron micrographs and photomicrographs The index is unusually well cross referenced

This excellent textbook while primarily designed for students should be a valued addition to the reference library of anyone who wishes to improve his grasp of the modern knowledge of histology

—BENNETT F. AVERY Capt (MC) USN

THE NURSE IN THE PUBLIC HEALTH PROGRAM by Pearl Partin Coulter
RN MS 309 pages G P Putnam's Sons New York NY 1954
Price \$4.75

This textbook is designed to orient the student nurse toward public health The basic concept is that of "teamwork" the characteristics of which are defined in the first chapter This concept is developed by discussion of the types of teamwork in which a nurse would participate in a public health program In regard to each distinct team such as that of nurse-doctor nurse-family or nurse-hospital the history of the association is briefly outlined and helps and hindrances to a good working relationship are indicated

There is liberal use of thought provoking devices such as questions to be asked and answered by the individual nurse herself Case studies are presented to illustrate various team relations and interactions some showing good teamwork others a poorer quality In most instances analysis of the quality of demonstrated teamwork is left to the reader Each team relationship is discussed with reference to its unique problems

The reader is given an outline of the varieties and types of services performed in the public health field by various groups and organizations Statistical material is used sparingly and when employed is incorporated into the text Each chapter is thoroughly annotated and the bibliography is adequate for any degree of further research desired by interested individuals

This book should be of interest to student nurses and beginners in the field of public health It can also be used as a reference volume on various types of public health services and the interrelationship involved in carrying them out smoothly and efficiently

—JUDITH M. LINNINCHILLER Lt (NC) USN

THE ADAPTIVE CHIN by E Lloyd D Brul DDS and H ry S b r MD
97 p ge ill strar d Cha les C Thom P bl h r Sp i gf ld Ill
1954 P c \$3 50

The theme of this monograph is speculation regarding the evolution of the chin of man Part I presents a historical interpretation of the shifting relation of jaw segments the influence of muscle action and jaw retrusion and reduction Part II compares the four principal themes of development the shifting theory (Verschiebungslehre) the effects of articulate speech the mechanical effects of retrusion of the teeth and the effects of muscle activity Part III consists of observations of the skull as a whole of the mandible and of the musculature Part IV compares the evolution of the skull and mandible of the orders Lago morpha Carnivora Notoungul ta and Primates It is hypothec ted that changes of skeletal form accompanying behavioral changes in bodily orientation have been found in orders entirely unrelated to each other or to the primates

This monograph may be of academic interest to students of comparative anatomy and paleo tology and to research workers in the field of growth and devel pment of the skull

—JAMES L. BRADLEY Comd (DC) USN

COAL TAR AND CUTANEOUS CARCINOGENESIS IN INDUSTRY by F t
C C mb s MD 76 pag ill trat d Ch rl C Th mas P bl h
Sp gf eld Ill 1954 P \$2 75

The advances of the chemical industry and the current world wide interest in the cause and pathogenesis of cancer make this problem of interest and concern to all physicians While the property of carcinogenic potency has long been ssociated with certain chemical compounds its import nce is stressed by the fact that over 300 are now capable of producing malignancy in laboratory nimals and about 35 are capabl of producing benign tumors

The author presents the carcinogenic nature of the certain fractions of coal tar in a practical and effective m nner The text is organized in eight sections as follows introduction general nature of carcinogenesis the tars the carcinogenic hydrocarbons photodynamic action of l ght the dermatergoses due to coal tar petroleum c ncer and advice for control of tar cancer The sect on dealing with the photodynamic action of light and certain coal tars and their role in the prod ction of cutaneous malignancies is of especial interest The sect on on dermatergoses due to coal tars is also of interest and of great value to the dermatologist and the industrial physician

The author has clarified a previously confusing aspect of cutaneous cancer and has produc d a practical guide and approach to the ever growing problem of coal t rs and cutaneous cancer This monograph is recommended to all physicians who observe and treat cutaneous malignancies —WILLIAM N PIPER Lt Col MC USA

FRONTAL LOBES AND SCHIZOPHRENIA edited by *Milton G reenblatt* M D
and *Harry C Solomon* M D 425 pages illustrated Springer Publishing
Co Inc New York N Y 1953 Price \$12 50

This book presents an exhaustive study of 116 patients with chronic schizophrenia subjected to lobotomy at the Boston Psychopathic Hospital. About three fourths of these patients were classified as non-intensive cases and were given only the clinical psychiatric examination before and after operation. The remainder received a battery of studies including clinical psychiatric study, psychologic investigation and electroencephalographic, sociometric and physiologic studies.

In essence this report is concerned with answering three questions: (1) What changes occur in the average patient following frontal lobe surgery? (2) How do patients who profit from surgery differ from those who fail to benefit? (3) What is the pattern of change of the group; how does postoperative distribution of patients along specific dimensions relate to preoperative distribution? Of its three parts, the first concerns the plan, method and preoperative studies; the second deals with the effects of frontal lobe surgery as approached from psychiatric, psychologic, sociologic, sociometric, physiologic and pathologic studies; and part three is concerned with elaboration of data, discussing the relative therapeutic efficacy of several operations as well as a comprehensive theory of frontal lobe functioning.

The data presented are crisp, clear and to the point. All the available knowledge to date is correlated and related to the study under question. This study represents a definite advance in the understanding of the relationship of the frontal lobes to schizophrenia and the effects of frontal lobe surgery. —LEO S MADLEM J M D

BACTERIOLOGY FOR MEDICAL STUDENTS AND PRACTITIONERS by
A D G adne D M 4th edition 271 pages illustrated Oxford Uni-
versity Press New York N Y 1953 Price \$3

The chief aim of this book, in the words of the author, is to present shortly, readably and relevantly as much of the vast subject of bacteriology as a medical student or a practitioner needs to know. Like most handbooks, however, the material in this text is necessarily restricted to an incomplete or inadequate coverage of the important facts which the physician should know. To cite a specific example, in the section dealing with antibiotics, no mention is made of sensitivity tests which are currently available to the physician. The role of antibiotic therapy is covered in a few short paragraphs.

The book presents much accurate and concise information in an interesting and readable manner and might well be considered an abbreviated copy of Topley and Wilson's *Textbook of Bacteriology*. Unfortunately, no references were included in the text for the reader's guidance to the current literature.

—DAVID F HERSEY F I LL USAF (MSC)

GIFFORD'S TEXTBOOK OF OPHTHALMOLOGY by F. ne H. d Adl
MD 5th d t 488 pag H tra d W B Sa d Co Ph la
d lph P 1953

This is the second edition of a work which provides in a single volume a comprehensive coverage of the modern concepts of physiology of the eye and the ocular adnexa and the clinical applications of these principles. It is a well organized textbook for the student of ophthalmology and an excellent reference book for the practicing ophthalmologist. The general plan and organization of the book is similar to the first edition but each section has been brought up to date to include the most recent advances in research and clinical experience.

This edition contains considerable new material in the sections on the cornea, aqueous humor and vitreous. The physiology of the extraocular muscles is covered more extensively than in the previous edition and contains the essence of the recent symposium on strabismus presented by the Academy of Ophthalmology and Otolaryngology. The newest concepts of visual acuity and their practical importance in refraction are well presented. The most recent work in the visual purple cycle including that of Wald has been included in the chapter on photochemistry. The bibliography at the end of each chapter is current and quite complete.

If an ophthalmologist were limited to ten volumes for his entire library this book should be included.

—FRANCIS X WEIXEL, M J USAF (MC)

FEELINGS AND EMOTIONS by L. w K. F a k. 38 p g D. b l d y &
C. I G d C ty NY 1954 P \$0.85

This pamphlet by an acknowledged leader and expert in the field of mental health is a model of epigrammatic writing which scientific and technical authors can well emulate when called upon to simplify the complicated subject matter for the layman. The author with his vast background and experience in this area together with his understanding and interpretation of new knowledge on this topic presents an abbreviated and simplified description of the most crucial aspects of feelings and emotions in personality development, human conduct and human living. He sketchily traces their nature and operation and their role in the various stages of the individual's development through infancy, childhood, adolescence and adulthood. He elaborates on the concept of emotional integrity and offers implications of emotional reactions for living and education. He emphasizes the naturalness of affective responses and shows how we can integrate them more effectively for wholesome living.

The booklet contains no index or bibliography nor is reference made to any other book or periodical. It can be read profitably by most laymen, students, teachers, social and medical scientists and practitioners during an evening of relaxation.

—FRANK WILLIAM J. LI, Col USAF (MSC)

SCIENCE AND MAN'S BEHAVIOR, by Trigant Burrow, M.D. Phil. Scilago
Philosophical Library Inc., New York N.Y., 1963, 164 pp., \$5.00

In a unique and intriguing manner the author re-examines the various scientific approaches to an interpretation of man's and society's disordered behavior. He exchanges views with 79 outstanding scientists in clarifying his new orientation to an analysis of the problems of individual and group conflict. In spite of seemingly great scientific advancements in psychologic studies, the development of ideologies and the dissemination of information man seems to be unable to cope adequately with a growing condition of world wide antagonism. This book is timely and is truly a product of the search for truth.

Dr. Burrow became dissatisfied with the stress in psychoanalysis upon individualism in human behavior and with mechanistic interpretations in the biological sciences. He turned to organismic techniques of interpretation and the emergent evolution of group thought. The understanding and resolving of the behavior disorders of the group became essentially a community task but the scientist must play a leading role in bringing about a reorientation because of his background and training in objective thinking.

The story of the personal struggle of the author to break his bonds of conventional thinking, the necessity of leaving his professional colleagues and embarking upon a scientific adventure with all the elements of chance, hardship and anxiety it entailed, is one to inspire others in their quest for truth. The re-education of groups of students to form his experimental communities produced an excellent result: a pattern for subjugating autopathic ideologies and facilitating group thinking toward the production of world wide health and universal happiness.

A glossary of 139 terms of which 65 are those originated by the author is included. The book is fully indexed and includes an appendix and 26 figures. An extensive bibliography and subject index make it a valuable reference.—WILLIAM HARRIS, JR., HARVARD

AGGRESSIVE TENDENCIES, by W. L. Marshall, M.D. 192 pages, 11 x 8 1/2 in. \$3.95. New York, New York, 1963. Field, E. L. 1963. 11 x 8 1/2 in.

Five of the most important attitudes toward aggression and five groups of Bender-Schiffrin et al. of 250 children participated in 1963 in 1963 the research and analysis of aggression.

significance of later behavior is insufficiently elaborated and what conclusions are drawn are seldom clear. The case material often seems to reflect inadequate criteria for evaluating play material and responses to a more or less standardized questionnaire given each child. What does emerge is a series of clinical impressions that might not withstand statistical scrutiny or justify sweeping generalizations and conclusions. They do however offer a valuable vicarious experience for those child psychiatrists whose own case material affords only occasional firsthand familiarity with children who have homicidal or suicidal histories.

It has long been a controversial question whether aggression is a primordial response equated to a death instinct or whether it represents more truly a life instinct in the sense of being a vital outgoing, essentially creative force. Apparently the author subscribes to the latter view in general but this sometime is not clear and through most of the papers the concept of aggression seems to carry the connotation of destructiveness and badness. The last two papers on the genesis of hostility and on anxiety in disturbed children are well worth reading and pondering over. — JAMES N. SUSSEX, *Comdr (MC) USN*

THE NATURAL MAN, by C. L. Leake. 70 p. 11 tra d D bled y & Co. I. G. d. City N.Y. 1954. Price \$0.95

Mainly by inference from field studies of man and chimpanzees the author of this monograph attempts to explore the nature of man as unmodified by the influence of culture. He does not minimize the difficulty of this task nor does he place too much value on the materials which are available. The conclusions are based on a review of the widely different ways of living found in various parts of the world which dispel the notion that attitudes and behavior prevalent in one particular group are necessarily universal human characteristics. The author finds that some human characteristics are ubiquitous. These include eating, sleeping, drinking, playing, talking, living in groups, conforming to some marriage restrictions, and adherence to some kind of norms of behavior. The construction of shelter and the use of fire and some tools are characteristic of all the cultures investigated. He concludes that we will never be able to obtain an accurate estimate of the natural man unless specific control situations are set up and human subjects are utilized. The reviewer agrees with the author that such experimentation will probably never be undertaken due to the taboos which our own culture has set up in regard to the utilization of human beings for purely scientific exploitation. However, it is only in a culture where such taboos come into being that there is likely to be an interest in the fundamental nature of man.

This stimulating study serves as a wholesome restraint on those students of human nature who are inclined to ascribe universality to their own particular set of values and norms and should be required reading for all who plan to make psychology and sociology their career.

—THEODORE C. KAHN, *Maj USAF (MSC)*

NEW BOOKS

Books received by the *U S Armed Forces Medical Journal* are acknowledged in this department. Those of greatest interest will be selected for review in a later issue.

DIGITAL PLETHYSMOGRAPHY Introducing a Method for Recording Simultaneously the Time Course of the Rate of Blood Flow Into and Out of the Finger Tip by *George E. Buch* M D F A C P Henderson Professor of Medicine Tulane University School of Medicine Physician-in-Chief Charity Hospital Consultant in Cardiovascular Disease Ochsner Clinic Hotel Dieu and Mercy Hospitals and Visiting Physician Touro Infirmary New Orleans Modern Medical Monographs 134 pages illustrated Grune & Stratton Inc New York N Y 1954 Price \$5

ROENTGENOGRAPHIC TECHNIQUE A Manual for Physicians Students and Technicians by *Darmon A. telle Rhinehart* A M M D F A C R Emeritus Professor of Anatomy and Roentgenology University of Arkansas Honorary Member American Society of X-ray Technicians Honorary Registered X-ray Technician Roentgenologist to St Vincent's Infirmary and the Missouri Pacific Hospitals Little Rock Ark. 4th edition thoroughly revised 454 pages 216 illustrations Lea & Febiger Philadelphia Pa 1954 Price \$8.50

THORACIC SURGERY by *Richard H. Sweet* M D Associate Clinical Professor of Surgery Harvard University Medical School 2d edition 381 page illustrations by *Jorge Rodgu z Arroyo* M D Formerly Assistant in Surgical Therapeutics University of Mexico Medical School W B Saunders Co Philadelphia Pa 1954 Price \$10

LUNG CANCER by *Seymour M. Farber* M D Associate Clinical Professor of Medicine University of California Medical School Lecturer in Diseases of the Chest University of California School of Public Health American Lecture Series Publication No 187 A Monograph in The Bannerstone Division of American Lectures in Chest Diseases edited by *J. A. Myer* M D Ph D F A C P Professor of Medicine and Preventive Medicine and Public Health University of Minnesota Medical School Minneapolis Minn 157 pages illustrated Charles C Thomas Publisher Springfield Ill 1954 Price \$4.75

MAYO CLINIC DIET MANUAL by The Committee on Dietetics of the Mayo Clinic 2d edition 247 page W B Saunders Co Philadelphia Pa 1954 Price \$5.50

BIOLOGY by *Claude A. Villee* Harvard University 2d edition 670 pages illustrated W B Saunders Co Philadelphia Pa 1954 Price \$6.50

IMPROVEMENT OF PATIENT CARE A Study at Harper Hospital by *Walter J. Wright* R. N. M. S. Associate Director Harper Hospital Detroit Mich Published in co-operation with and under the sponsorship of the American Hospital Association 236 pages illustrated G. P. Putnam's Sons New York N Y 1954

PRINCIPLES OF VETERINARY SCIENCE by F d ck Bou H dly
D V M F me ly Pr f of V t t n a y S c U y f
W d V e t r n a of th W co Ag ltural E pe me t
Stat 5th d t 546 page Il trat d W B Sa d C Ph l
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TEXTBOOK OF ORGANIC MEDICINAL AND PHARMACEUTICAL CHEMISTRY dit d by Ch l O W l Ph D P f r f Pharma
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EAT THINK AND BE SLFNDER by L d A tk n, M D w th th t t
f F d K m 223 pag Il w th Book l c N w Y k N Y
1954 P \$2 95

THE TECHNIQUE OF PSYCHOTHERAPY by L w R W lb g M D
D c P tg duat Ce te f Psychoth rapy A oc t Cl l
P fe f Psych at y N w Y k M d c l Coll g 869 p ge Gru
& Stratt l N w York N Y 1954 P \$14 75

ELI CTROCARDIOGRAPHY by E G y D m nd M D P f d Cha r
ma D p me t of M d Dr Ca d c l Labo tory
U ty f K ns Med l Ce r A City K 261 p ges
272 Il rat on Th C V M by Co S Lo M 1954 Pr
\$14

HUMAN BODY SIZE AND CAPABILITIES IN THE DESIGN AND OPERATION
OF VEHICULAR EQUIPMENT by R A M F l nd Ph D Alb t
D mon, M D Ph D H n d W St udt M A Alf d l A el y
M A J k W D l p M A nd W ll m A H ll M A 239 p ge
Il trat d Il d Sch l of P bl He lth 695 Il t g A
Bo t M 1953

NURSING IN CLINICAL MEDICINE by *Julius Jensen*, Ph D (in Medicine) M. R. C. S. (England) L. R. C. P. (London) Diplomate of American Board of Internal Medicine (Cardiovascular Disease) Formerly Assistant Professor in Medicine Washington University St. Louis and *Deborah Vaclurg Jensen* M. A. B. Sc. R. N. Extension Instructor in Sociology and Nursing Education University of Missouri Formerly Assistant Director School of Nursing Washington University St. Louis With a section on Diseases of the Skin by *Richard S. Weiss* M. D. Associate Professor of Clinical Dermatology Washington University St. Louis and *Adolph H. Corrad* M. D. Assistant Professor of Clinical Dermatology Washington University St. Louis and a section on Rehabilitation by *Florence Jones Terry* B. S. R. N. Formerly Instructor School of Nursing St. Luke's Hospital St. Louis 4th edition 89 pages illustrated The MacMillan Co. New York N. Y. 1954

AMEBIASIS by *E. Nest Carroll Faust* A. B. M. A. Ph. D. The William Vincent Professor of Tropical Diseases and Hygiene Head of the Division of Parasitology Department of Tropical Medicine and Public Health Tulane University of Louisiana New Orleans La. American Lecture Series Publication Number 191 A Monograph in American Lectures on Internal Medicine edited by *Roscoe L. Pullen*, M. D. F. A. C. P. Professor of Medicine and Dean University of Missouri School of Medicine Columbia Mo. Consultant to the Surgeon General Department of the Army Washington D. C. 168 pages 30 illustrations Charles C. Thomas Publisher Springfield Ill. 1954 Price \$4.75

CARDIOVASCULAR SURGERY by *Gerald H. Patt* M. D. F. A. C. S. Associate Clinical Professor of Surgery New York University College of Medicine Attending Surgeon and Chief of the Vascular Clinic Saint Vincent's Hospital City of New York Attending Surgeon St. Charles Hospital City of New York Diplomate of American Board of Surgery Consultant to the U. S. Naval Hospitals Meadow Brook Hospital Long Island All Souls Hospital Morristown N. J. 843 pages 358 illustrations on 261 figures and 4 plates in color Lea & Febiger Philadelphia Pa. 1954 Price \$15

THE UNCOMMON HEART DISEASES by *Nathaniel E. Reich* M. D. F. A. C. P. F. C. C. P. Clinical Assistant Professor of Medicine State University of New York College of Medicine Associate Attending Physician Kings County Hospital Attending Physician in Cardiology Veterans Administration Attending Cardiologist Jewish Sanatorium and Hospital for Chronic Diseases Diplomate American Board of Internal Medicine Fellow American College of Physicians Fellow American College of Chest Physicians (Cardiovascular Committee) Brooklyn Society of Internal Medicine 528 pages 601 illustrations Charles C. Thomas Publisher Springfield Ill. 1954 Price \$10.50

ATLAS OF ORTHOPEDIC TRACTION PROCEDURES by *Calo Scuderi* M. D. M. S. Ph. D. Clinical Associate Professor of Surgery University of Illinois Professor of Surgery Cook County Graduate School Attending Surgeon Cook County Hospital Chairman of Department of Orthopedic Surgery St. Elizabeth Hospital and Columbus Hospital Senior Orthopedic Surgeon Alexian Brothers and St. Anne's Hospitals Consulting Orthopedic Surgeon Augusta Hospital Chicago Consulting Orthopedic Surgeon McNair Memorial Hospital Berwyn Ill. Member of American Academy of Orthopedic Surgery Clinical Orthopedic Society American Association for the Surgery of Trauma Western Surgical Association American Medical Association American College of Surgeons 230 pages 174 illustrations The C. V. Mosby Co. St. Louis Mo. 1954 Price \$12.50

A FORMULARY FOR EXTERNAL THERAPY OF THE SKIN by Chas. N. F. M. D. D. P. H. Edw. d. W. ggl. swo. th Prof. s. r. of D. rma. tol. gy. H. vard. M. d. c. l. Sch. ol. Ch. f. f. th. D. rmatolog. al. Se. c. Ma. s. h. rt. Ge. ral. Ho. p. tal. B. ton. M. d. lrv. H. Bla. k. Ph. D. Re. a. h. A. c. t. D. rmat. l. gy. H. va. d. Med. c. l. S. h. l. M. s. h. ett. Ge. l. Ho. p. tal. B. r. M. s. Am. r. c. Le. tur. S. e. P. bl. to. No. 201. A. Mo. gr. ph. th. B. e. t. D. i. on. f. Am. r. L. tue. n. D. mat. l. gy. Ed. t. d. by. A. th. C. Curt. M. D. Cha. ma. D. pa. tm. t. of. D. mat. l. gy. d. Syph. l. l. gy. U. r. sty. f. M. h. ga. A. A. bo. M. h. 118. pag. s. ill. u. str. at. d. Char. l. s. C. Th. m. P. bl. sh. r. Sp. ngf. Id. Ill. 1954. P. r. c. \$3.25

AFORRHAGIA—MENSTRUAL DISTRESS by W. H. m. Beck. M. D. Diplom. at. Am. e. a. B. rd. Ob. t. t. s. d. Gy. c. l. gy. Atte. d. g. Gyne. l. g. r. t. R. t. e. t. f. S. ck. Shelt. r. g. Arms. R. hm. d. Comm. ty. nd. E. g. el. i. B. th. H. sp. tal. R. hm. d. V. Ameri. n. L. ctur. S. s. P. bli. a. N. 208. A. M. gr. ph. s. Ame. c. L. tur. Gy. c. logy. d. Ob. t. r. Ed. t. d. by. E. C. H. mbl. M. D. F. A. C. S. P. f. o. f. E. d. l. gy. A. o. t. P. of. s. f. Obat. tr. d. Gy. c. l. gy. D. k. U. s. ty. School. of. Med. c. l. Ch. f. of. th. D. f. E. d. c. l. gy. a. d. E. d. c. l. g. r. D. k. Ho. p. t. l. Durham. N. C. 17. pag. ll. u. rat. d. Cha. l. C. Th. ma. P. bli. he. Sp. gfi. Id. Ill. 1954. P. r. c. \$2.75

INTRODUCTION TO CLINICAL PSYCHOLOGY ed. t. d. by. L. A. P. g. Ph. D. P. f. o. of. P. y. h. l. gy. U. r. ty. of. Ill. nd. A. Be. g. Ph. D. A. te. P. f. o. of. P. y. hol. gy. N. th. U. s. ty. 2d. ed. on. 709. pag. ll. u. rat. d. Th. R. Id. C. N. w. Y. k. N. Y. 1954. P. r. c. \$6.50

THEORY AND PROBLEMS OF ADOLESCENT DEVELOPMENT by D. d. P. A. f. l. M. D. Ph. D. Bur. f. Ed. t. f. R. t. h. U. r. ty. f. Ch. mp. g. Ill. 580. pag. G. & Stratt. l. N. w. Y. k. v. 1954. P. r. c. \$10

THE YEAR BOOK OF NEUROLOGY PSYCHIATRY AND NEUROSURGERY 1953-1954 Y. B. k. S.) N. urol. gy. ed. t. d. by. R. l. nd. P. M. kay. M. D. P. r. f. N. l. gy. U. r. ty. f. Ill. At. d. g. N. o. P. y. h. t. St. L. k. H. p. l. Ch. g. P. y. h. try. d. d. by. l. D. C. Lu. M. D. t. of. R. ch. s. N. urol. gy. nd. P. y. ha. y. w. J. y. St. t. Ho. p. tal. s. nd. Age. N. uros. gery. d. t. d. by. P. l. B. l. y. M. D. D. st. g. h. d. P. f. e. o. f. N. urol. gy. d. l. l. g. l. Surg. y. U. e. r. ty. f. Ill. a. d. O. S. g. M. D. A. P. f. s. f. N. urol. g. l. Surg. y. U. e. r. ty. f. Ill. 604. pag. ll. s. rat. d. Th. Y. Book. P. bli. h. r. l. Ch. g. Ill. 1954. P. r. c. \$6

JOSEPH BARCPOET 1872-1947 by K. th. J. F. kl. f. h. M. d. cal. C. ll. g. f. S. B. h. l. m. w. H. p. tal. 381. pag. ll. u. rat. d. Char. l. C. Th. m. P. bl. sh. Sp. gf. Id. Ill. 1953. P. r. c. \$8.50

COUNSELING THEORY AND PRACTICE by H. Id. B. P. p. nsky. A. socia. P. f. f. P. y. h. l. gy. d. Dur. ct. f. R. ch. O. pat. onal. Oppor. t. Serv. Th. Oh. Sta. e. U. r. ty. d. Pa. l. A. hol. P. p. nsky. P. r. h. A. c. te. P. ych. l. gy. Th. Oh. Stat. l. v. ty. 307. pag. Th. R. Id. P. Co. New. Y. k. N. Y. 1954. P. r. c. \$4.50

THE PSYCHOLOGY OF MENTAL HEALTH by L. P. Th. pe. Ph. D. P. r. f. f. Ed. d. P. y. hol. gy. U. e. y. of. S. th. n. Cal. for. 747. pag. ll. u. rat. d. Th. R. Id. P. r. s. Co. N. w. Y. o. k. N. Y. 1950

INSTRUCTIONS FOR AUTHORS

The *United States Medical Journal* is devoted to the publication of original investigations, observations, and clinical experiences of officers and personnel of the medical service of the three military departments. Contributions who are affiliated with one of the military services by appointment or by civilian capacity, should send manuscripts to the Surgeon General of the United States Army, Navy or Air Force, Washington, D. C., in accordance with existing regulations. The covering letter should state that the author desires the manuscript to be given consideration for publication in this Journal. Accepted manuscripts become the property of the Armed Forces Medical Publications Agency and will not be returned.

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REFERENCES

References to published literature should be listed at the end of the article in the numerical order in which they are cited in the manuscript. Careful attention in their preparation will expedite publication of the article. Following are a few examples of references:

Plimling, A. George M. & Fickett, J. and Heister, S. J. *Protein content of blood serum after various doses of fat-free tyrosine*. *J. Biol. Chem.* 1944, 154: 1-4.

Cabot, J. C. *Ferric chloride as a blood coagulant*. *Proc. Soc. Exper. Biol. Med.* 1922, 19: 222-223.

In Oster, W. *Chemical Methods of Analysis*. 2nd ed. 1925, p. 222.

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FOREWORD

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The significance of basic research in the medical field for the military services is easy to trace. Many battles and wars were lost because of epidemics and effective prevention of epidemics became possible only after the advent of the bacteriologic era and the beginning of systematic scientific research in bacteriology and epidemiology.

Prior to World War II the erroneous notion that skin diseases were not serious and the belief that their management was an easy task and not requiring specialist training were grievous stumbling blocks in dermatologic research. Dermatologic problems of World War II were reviewed by such authorities as Pillsbury, Livingood, and Sulzberger. They were summarized by Hierland, who applied them to an analysis of the dermatologic problems in the Korean campaign.

Although dermatologic research is a relatively young and undeveloped branch of clinical science, it has made contributions to basic medical knowledge in such important fields as allergic conditions, sarcoidosis, and diseases of connective tissue ground substance. Most researchers in the preclinical sciences are unaware of many problems of dermatology.

The erroneous concept that dermatologic research could be left done by nondermatologists was successfully opposed by leading dermatologists in this country and resulted in the establishment of a subcommittee on the cutaneous system by the National Research Council. The majority of its members were dermatologists.

Hierland has enumerated the immediate practical and unsolved problems in which the armed services are vitally interested: chronic pyogenic and fungus infections, pruritus, eczematous eruption of hands and feet, harmful effects of tropical exposure, contact dermatitis, warts (particularly plantar), allergic states, severe acne, psoriasis, and seborrheic dermatitis and pyoderma. The armed services recognize the basic principle that disturbed functions cannot be well understood and remedied without thorough knowledge of the normal functions. They are becoming strong pillars supporting basic dermatologic research in this country. Their hospitals and clinics have become important centers of dermatologic research.

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SPECIAL PROBLEMS IN THE DIAGNOSIS AND MANAGEMENT OF SYPHILIS IN MILITARY PERSONNEL

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SPECIAL problems in the diagnosis and management of syphilis in military personnel will be discussed in this report. According to a recent editorial by Moore¹ the discovery rate of early latent, late latent, and late symptomatic syphilis reached a peak in 1943 and has steadily declined since. The peak was due to the nationwide application of mass blood testing by law (in premarital and prenatal examinations) by regulations (as in the armed services), and by custom (as in routine examinations of all persons by physicians, or of industrial workers). The 1952 level was only 40 percent of the 1943 peak and this reduction is due to the sharply decreased incidence of fresh infections and the beginning exhaustion of the reservoir of previously unidentified latent and late cases. The marked reduction in the incidence of fresh infections since 1943 is undoubtedly due to the widespread use of penicillin and the newer broad spectrum antibiotics not only for the treatment of syphilis but for many other diseases as well.

With the marked curtailment of funds to the United States Public Health Service for syphilis therapy and control, there may be an increase in the attack rate of syphilis in the near future. Undoubtedly this would also affect the attack rate of early syphilis in military personnel. Because of this reduction in funds state laboratories are limiting routine performance of serologic testing of blood and spinal fluid specimens. As a result, many patients with asymptomatic syphilitic infections will not be detected or subjected to therapy before the possible development of the late destructive sequelae. Medical officers in the armed services may be faced with diagnostic and therapeutic problems in syphilis for some time to come.

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Presented by Dr. Rein before the Panel on Military Medicine at the twelfth annual meeting of the American Academy of Dermatology and Syphilology, Chicago, Ill., December 1953.

THE TREATMENT OF SYPHILIS

Voluminous data have been accumulated on the efficacy of penicillin therapy in syphilis since the first report by Mahoney and associates. On the basis of the information now available there can no longer be any doubt that penicillin has revolutionized the control and treatment of syphilis in the armed services. Numerous reports concerning different dosage schedules employed by the military services have appeared in the literature in recent years, many of which vary widely in the amounts of the drug used and the duration of treatment. In view of the highly satisfactory results obtained with the repository forms of penicillin and the greater convenience to the infected military personnel and medical officer alike, it is understandable why a definite trend has developed toward this form of therapy. Curtis and associates¹ stated that the repository preparation of choice in the treatment of syphilis is procaine penicillin in oil with 2 percent aluminum monostearate (PAM). This type of penicillin is now used almost entirely for all types and all stages of syphilis in military installations, public health clinics, and the World Health Organization sponsored treatment campaigns throughout the world. The dosage schedules recommended in this report are as follows:

Early syphilis (primary or secondary) 2 400 000 units intramuscularly as first treatment (single injection or equally divided in each buttock). This is called the epidemiological dose, which not only will render the patient noninfectious but has a 95 percent chance of curing the infection. This is followed by four additional injections (600 000 units each) at three to four day intervals.

Late and latent syphilis 600 000 units daily for 10 days or twice weekly for five weeks (total dose 6 000 000 units).

Neurosyphilis A total dose of 6 000 000 to 12 000 000 units (600 000 units daily or twice weekly).

In a recent publication, our group at Bellevue Hospital reported the results of treatment of early syphilis with a single injection of PAM (Flo-cillin 96). This study was initiated in May 1948. The purpose was to determine what could be accomplished with a single injection because such schedules of therapy are of special value in those underprivileged countries where the majority of patients with treponemal diseases must be treated in the shortest time and on an ambulatory basis in rural clinics. Originally we administered a single injection of 1 200 000 or 2 400 000 units of PAM, but since June 1950 alternate patients have been receiving a single treatment of 2 400 000 or 4 800 000 units of PAM. The series included 50 patients with primary lesions (seronegative and seropositive) and 194 with secondary

hills These patients had been followed clinically and serologically for from nine months to five years All of the patients seronegative and seropositive primary syphilis, treated with single injection of 1,200,000, 2,400,000, or 4,800,000 units of 1 had attained and maintained seronegativity when last examined

The results were less dramatic in the series of 124 patients with secondary syphilis It was gratifying to note, however that with the 1,200,000 units schedule, only nine (13.0 percent) of the 69 patients required re-treatment because of relapse or reaction There appeared to be no appreciable difference in the results obtained with the 2,400,000- and the 4,800,000-unit schedules From our studies we believe that a single injection of 1,200,000 units of PAM is a satisfactory procedure for seronegative and seropositive primary syphilis If a single treatment for secondary syphilis is used it seems advisable to give 2,400,000 units of PAM

With the new relatively insoluble and slowly absorbed N,N-dibenzylethylenediamine dipenicillin G (bicillin) a single injection of 2.4 million units is reported to be effective⁵

Levin and associates recently reported the value of a new combination of three penicillin salts (panbiotic) in the treatment of patients with treponemal diseases A single dose of 2 ml in aqueous suspension provides 300,000 units of potassium penicillin G, 300,000 units of procaine penicillin G, and 600,000 units of N,N-dibenzylethylenediamine dipenicillin G This combination was conceived by Buckwalter⁶ on the basis of the solubility variations of each penicillin salt When administered as a single intramuscular injection it should provide (1) an initial high blood concentration within one hour due to the rapid solubility and absorption of the potassium penicillin G, (2) an intermediate blood concentration for from 24 to 36 hours due to the less soluble procaine penicillin G and (3) finally a prolonged blood concentration for at least 15 days or longer in the majority of patients due to the relative insolubility of N,N'-dibenzylethylenediamine dipenicillin G Microbiologic assay determinations indicate that higher and more prolonged blood levels are obtained with a single injection of 2 ml of this material than with a single injection of 4 ml of PAM, even though both contain 1,200,000 units of penicillin Initial clinical trials with this combination of three penicillin salts in syphilis, yaws, and pinta are highly encouraging

INDICATIONS FOR RE-TREATMENT

During the past eight years considerable literature on the value of penicillin therapy in syphilis has accumulated, but relatively little has been published on the indication for re-treatment Large

numbers of military personnel are being re-treated without adequate cause. Such indiscriminate and needless re-treatment may produce severe psychic trauma to the individual as well as avoidable expense, loss of time and discomfort. Indications for re-treatment in three groups of persons will be discussed.

Group 1 Asymptomatic reinfections vs serorelapse. Some physicians were discouraged with penicillin therapy because they were of the opinion that the alleged relapse or failure rate was excessive. Unfortunately it is often difficult or impossible to differentiate between serorelapse and asymptomatic reinfection. Because syphilis may be cured in a relatively short time it is possible for patients to be reinfected by subsequent exposure. In fact a person may even be reinfected with his original treponemata which were deposited in his sexual contact soon after his first infection. There is no question but that such instances of ping pong syphilis are a more frequent occurrence than has been appreciated hitherto. Whether or not an adequately treated patient with early syphilis will develop a new chancre at the site of inoculation will depend on the extent of immunity developed from the original infection. Judging from animal experimentation the degree of immunity is usually dependent upon the duration of the original infection prior to therapy and the number of organisms involved in the reinoculation.

It is possible for certain patients with syphilis to develop partial or relatively complete immunity. If the only evidence of reinfection is a rise in serologic titer it is almost impossible to distinguish this condition from a serologic relapse.

Re-treatment should be administered to all patients with serorelapse and with asymptomatic reinfection. An attempt should be made however to differentiate between them prior to the institution of re-treatment for the following reasons:

1. If the patient is categorically classified as serorelapse no attempt may be made to determine and eradicate a possible source of reinfection. The patient with asymptomatic reinfection warrants the same epidemiological investigation as does the patient with clinical evidence of reinfection.

2. If these patients are categorically classified as serorelapse instead of asymptomatic reinfection there is a fallacious increase in treatment failure rates.

Rule (1) Attempt to differentiate between asymptomatic reinfection and serorelapse prior to treatment. (2) Do not categorically classify all of these re-treated patients as serorelapse because this creates a fallacious increase in treatment failure rates. (3) Re-treat all patients with asymptomatic reinfection and serorelapse with penicillin alone. The use of penicillin combined

with heavy metal therapy is not indicated (4) Search for possible infectious contacts even in apparent serorelapse

Group 2 Persistently positive serologic tests in treated late and latent syphilitics (seroresistance) Following penicillin therapy most physicians were gratified by the rapid disappearance of treponemata from the early lesions of syphilis and the prompt healing of early and late cutaneous manifestations. Some, however, were disappointed by the slow serologic response. This lag in serologic reversal caused fallacious pessimism among those who had hoped for a more rapid reversal to seronegativity. In late symptomatic or latent syphilis and in late congenital syphilis it is only on infrequent occasions that there is a reversal to seronegativity, even within five years of treatment. Unfortunately some physicians fail to realize that the persistence of positive serologic tests for syphilis does not necessarily indicate the persistence of infection.¹⁰

It has been our experience and that of others, that re-treatment of latent syphilitics with persistently positive serologic reactions does not produce a more rapid reduction in serologic titer than in a control group of patients who are not subjected to re-treatment.

Following the original schedule of therapy, the patient should be subjected to quantitative serologic examinations at three-month intervals for one year and less frequently thereafter in order to note serologic response.

Rule Re-treatment is indicated if (1) There is serologic evidence of serorelapse or asymptomatic reinfection as evidenced by a sustained rise in serologic titer and (2) there is definite clinical evidence of relapse.

Group 3 Neurosyphilis The results of spinal fluid examinations serve as a guide both for activity of the syphilitic process and the efficacy of treatment. Following the original therapy spinal fluid examinations should be performed at six month intervals for one year and yearly thereafter until all spinal fluid tests are negative. If the disease process has been arrested all tests will show progressive decline to normal values without re-treatment. A period of five years or more may elapse however before the complement-fixation tests and the colloidal reactions become negative.

Dattner and Thomas¹¹ have shown that following successful therapy of all types of neurosyphilis the cell count declines to three or less per cubic millimeter within about six months. Thus a normal cell count is the earliest and most sensitive index of the arresting of the disease. The total protein values also decline but not so rapidly as the cell count. The persistence of positive colloidal reactions and complement-fixation tests does not necessarily indicate a persistence of active infection.

Dattner has also ably demonstrated that there is no constant correlation between spinal fluid results and clinical findings. In many patients there may be definite clinical improvement and yet the spinal fluid findings may indicate an active syphilitic process. The reverse may also be true as in burned out tabes where the spinal fluid findings may be normal but the patient has persistent clinical evidence of neurosyphilis. Irreparable neuraxis damage may have already occurred and clinical manifestations may persist even though the active syphilitic process has been arrested.

Reactivation of the neurosyphilitic process is usually indicated by a persistence or increase in the values of all spinal fluid tests including cell count, total protein, colloidal reactions and quantitative serologic tests for syphilis. The cell count is usually the first to show this increase.

Rule (1) Re-treatment should be instituted when there is evidence of activation in the spinal fluid findings. (2) Re-treatment with larger doses of penicillin administered over a longer time should be given to those who failed to respond satisfactorily to the original course of therapy. (3) Re-treatment should not be given because of persistently positive colloidal or complement-fixation reactions. (4) Other modalities of treatment should be used when indicated to improve the general health of the patient.

EXPOSURE TO PATIENTS WITH PROVED EARLY SYPHILIS

It has been stated by Alexander and Schoch¹ and others that more than 50 percent of persons exposed to patients with proved early syphilis will eventually be infected. It has also been demonstrated that the "prophylactic" treatment of syphilis during the incubation period with a single injection of 2.4 million units of PAM will effectively prevent the development of syphilis in almost every instance. From the public health point of view there is no doubt that the treatment of all syphilis contacts is indicated because it would serve to reduce the incidence of new clinical infections. There is, however, disagreement as to the management and follow up of contacts. Several leading syphilologists revealed that it is their custom to ask the contacts to return for a serologic recheck at one to three month intervals for one year following completion of treatment. Moreover, spinal fluid examinations are rarely done. Yet if that same patient is seen one week later when there may be clinical and/or serologic evidence of early syphilis, the patient receives similar or additional therapy. Methods should be enforced to ensure the patient's return for clinical and serologic rechecks and at least one spinal fluid examination. If contacts are to be treated prior to the development of clinical and serologic manifestations, they are entitled to the

same follow up and enforced protection as the person with proved early syphilis. Therefore, the treatment must not only be adequate but the individual should be given the same follow up as the patient with clinical evidence of early syphilis in order to detect and treat possible relapses and reinfections.

Rule In handling the syphilis contact, assume that he has acquired the disease, administer adequate "preprimary treatment" and enforce clinical and serologic re examinations.

FALSE POSITIVE REACTORS vs LATENT SYPHILIS

Medical officers are often confronted with a military patient in whom a routine serologic examination reveals a positive serologic test for syphilis uncorroborated by any evidence of the disease. In many instances, the patient is not subjected to all the prescribed procedures required to establish or exclude the diagnosis of a syphilitic infection. Penicillin therapy is often administered in preference to subjecting the patient to a time consuming and relatively expensive investigation. The importance of serologic and clinical rechecks following treatment is not stressed. The medical officer may fail to realize that once he has instituted treatment such a person should be considered as probably syphilitic and therefore is entitled to the same follow up as a proved syphilitic. Nelson and Mayer¹⁵ have conclusively proved the existence of specific antitreponema antibodies in the serums of latent syphilitics by means of their immobilization phenomenon.

Moore and Mohr¹⁶ applied the TPI test to 300 seropositive patients in whom the diagnosis lay between false positive reactors and latent syphilis. They found that about 45 percent were biologic false positive (BFP) reactors and did not have syphilis. Confirmation of these findings with an almost identical incidence of BFP reactors has been reported by Nelson¹⁷ and Miller.¹⁸

In the armed services all military personnel are subjected to serologic examinations with the standard serologic techniques employing lipid antigens. Serologic reactors who present no clinical or anamnestic evidence of syphilis should then be examined with the TPI test before establishing a diagnosis of syphilis. Specific criteria for submission of specimens for examination with the TPI test have been set up in the Navy. The following are the criteria which will be used in the Army.¹⁹

The TPI test is *not* indicated and *should not* be requested under the following conditions:

1 Where the diagnosis of syphilis has been definitely established on the basis of unequivocal clinical and anamnestic evidence. The requirement would be fulfilled under the following conditions: (a) Where *Treponema pallidum* has been identified by darkfield examination of primary or secondary lesions; (b)

Where a diagnosis of secondary syphilis made on clinical evidence (rash et cetera) has been corroborated by repeated positive reactions in the standard cardiolipin microflocculation (CM) and cardiolipin complement-fixation (CCF) tests of the Army and Air Force (c) Where a patient repeatedly seropositive in one or both of the standard cardiolipin tests (CM and/or CCF) has been shown to have evidence of visceral syphilis especially involvement of the cardiovascular or central nervous system Cases of inactive syphilis of the central nervous system (Dattner Thomas type 1 e CCF and colloidal gold positive cell count and total protein within normal limits) will fall in this category

2 Where a patient is an infant born of a seropositive mother in which case the positive serum reaction may be due to passively transferred antibody

The TPI test is indicated and a request should be initiated under the following conditions

1 Where the patient has been *repeatedly* seropositive in one or both of the standard STS and there is neither clinical nor anamnestic evidence of a syphilitic infection There should be no evidence of visceral involvement, i e cardiovascular disease of CNS syphilis Seropositivity should have persisted for three months *without significant reduction in titer* as determined by repeated cardiolipin microflocculation tests (STS) (During this period no syphilitic chemotherapy should have been administered The TPI test should be requested after the last standard serologic test for syphilis)

2 In the occasional instances where the patient has been repeatedly seronegative in both of the standard cardiolipin tests (STS confirmed over a three month period) but shows evidence of visceral syphilis e g cardiovascular involvement

The results of the initial TPI test should be confirmed one week later by submitting a second specimen (10 ml) of sterile serum

If the TPI test is positive it may be assumed the patient has or has had a treponematosus disease He should then be carefully re questioned and re examined for any anamnestic or clinical evidence of a treponematosus especially syphilis of the cardiovascular and central nervous systems The therapeutic management will of course depend on the results of the above examinations If the TPI test is negative then an attempt must be made to find out why the patient has a false positive blood test Moore and Mohr¹⁷ have begun a systematic study of this problem In a preliminary report covering the first 51 patients studied one had rheumatoid arthritis and four were found to have disseminated lupus erythematosus In 21 others there were clinical disorders pointing toward a diagnosis of lupus erythematosus but without as

yet definite proof In 14 additional patients there was definite evidence of laboratory abnormalities Only six of the 51 BFP reactors were normal except for the positive STS We have had similar experiences with a group of BFP reactors that we have been investigating We are convinced that the patients with positive STS and negative TPI tests are potentially seriously ill and should not be considered as an innocuous group

Rule (1) Seropositive reactors should be carefully investigated in an attempt to establish or exclude a diagnosis of latent syphilis prior to therapy (2) Whenever possible, demonstrate the presence of specific antitreponema antibodies by means of Nelson's immobilization phenomenon (3) Withhold therapy for three to six months in order to afford the patient the opportunity of reverting to spontaneous seronegativity (4) Where adequate work up is not feasible due to lack of facilities or poor patient co-operation, therapy should probably be administered to prevent the possible development of late syphilitic sequelae (5) Once treated, the patient should be considered as a probable latent syphilitic and should be afforded the same follow up as a treated proved latent syphilitic (6) However, the biologic false positive reactor may be correctly identified even after and in spite of antisyphilitic treatment

SUMMARY

Special problems arise in the diagnosis and management of syphilis in military personnel In the diagnostic and therapeutic management of such patients indiscriminate institution of anti-syphilitic therapy should not be made without attempting to establish or exclude the existence of a specific infection

If the original diagnosis is accurate, if the original therapy is adequate, and if the medical officer has a basic understanding of the value and limitations of various serologic tests the frequency and amount of unnecessary re treatment will be reduced considerably

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DERMATOLOGIC RESEARCH

Dermatologic research has become a rewarding and exciting venture for an increasingly large band of investigators. Uniquely available the skin offers a rich variety of problems susceptible to attack by all the basic methodology of medical research. A single hair, drop of sweat, the invisible film of sebum—each offers a stimulating challenge to the investigator. Here are frontiers of exploration at one's very fingertips.

—WALTER B. SHELLEY, M.D.

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THE EFFECT OF STILBENES AND RELATED COMPOUNDS ON THE MYCOSES

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DURING the last five years there has been an increasing interest in the clinical use of a group of aromatic diamidines in the treatment of systemic mycotic infections. This group includes stilbamidine (4,4'-stilbenedicarboxamidine), propamidine (p,p'-trimethylenedibenzamidine), and pentamidine (p,p'-pentamethylenedibenzamidine) which were developed in England mainly for the treatment of leishmaniasis and trypanosomiasis. Schoenbach and Greenspan¹ have published an excellent review on the pharmacology and therapeutic applications of these aromatic diamidines.

The *in vitro* antifungal activity of these compounds was first studied by Elson² in 1945 when he reinvestigated their reported bactericidal activity and included a number of pathogenic fungi as test organisms. He found striking inhibition of the growth of *Blastomyces dermatitidis* and *Sporotrichum schenckii* by propamidine. This was confirmed later by other reports.³⁻⁵

Parsons and Zarafonitis⁶ in a review of histoplasmosis, cited two patients with histoplasmosis who were treated alternately with stilbamidine and ethylstilbamidine (neostilbosan), an antimony preparation. The treatment in one patient was unsuccessful while that in the second patient gave excellent results. Seabury⁷ did not observe any significant effect on the course of histoplasmosis in two patients treated with stilbamidine. More recently, remission was obtained in a patient with disseminated histoplasmosis with ethyl vanillate given orally and with propamidine applied topically on the epiglottic lesions.⁸ The first report on the use of the diamidines in blastomycosis was made in 1950 by Colbert and associates⁹ who described a cutaneous lesion of blastomycosis which was greatly improved with the use of propamidine. This was fol-

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lowed by a number of reports confirming the clinical effectiveness of stilbamidine and propamidine in the treatment of patients with cutaneous and systemic blastomycosis.¹ Miller and associates reported the successful use of stilbamidine in a patient with actinomycosis which was resistant to sulfonamides and penicillin. A patient with sporotrichosis was apparently cured by stilbamidine although its routine use for this condition was not advocated because of its toxicity. The compound was suggested as a last resort in cases resistant to iodides. The clinical course of cryptococcosis in three patients was not influenced by the intravenous administration of stilbamidine.

Diethylstilbestrol although not an aromatic diamidine is closely related to stilbamidine in that it possesses a stilbene nucleus. This similarity in the chemical structures of stilbamidine and diethylstilbestrol was pointed out by Curtis and Harrell and the possible effectiveness of diethylstilbestrol in the treatment of blastomycosis was suggested. Two patients with cutaneous blastomycosis had complete regression of the lesions in from three to four months with daily administration of 3 mg diethylstilbestrol.

CLINICAL EXPERIENCES

Stilbamidine a white crystalline powder is given in daily doses of 150 mg dissolved in from 250 to 500 cc of 5 percent dextrose solution and administered intravenously by slow drip in order to avoid nitritoid like reactions and local thrombophlebitis. The solutions must be prepared fresh before administration and protected from light. Exposure to sunlight not only causes a deterioration of therapeutic potency but also increases the drug's toxicity.

The optimum amount and best mode of administration of stilbamidine required to destroy the organisms of blastomycosis in a patient is still not known. It may be given in courses of from 1⁰ to 24 daily injections barring any untoward reactions. We have induced disappearance of cutaneous and systemic lesions with total amounts of from 3 to 3.9 grams. Schoenbach and associates²¹ believed that from 4.5 to 6 grams of stilbamidine in two or three courses are sufficient for cure.

The immediate toxic reactions of stilbamidine noted by Irlk and Henry may include dizziness, nausea, epigastric discomfort, vomiting, sweating, breathlessness, fall in blood pressure and incontinence of feces and urine. These toxic reactions can be obviated by the use of the slow intravenous drip method of administration. We have observed only slight and transient nausea and dizziness among our patients. In one patient the course had to be interrupted due to leukopenia and on another occasion to signs of hepatic insufficiency. This emphasized the desirability

of checking the white blood cell count, hepatic function, and renal efficiency during the administration of stilbamidine

An interesting toxic reaction of stilbamidine, because of its uniqueness, is the late development of neuropathy consisting of such sensory disturbances as paresthesias, anesthetics and numbness over the distribution of the trigeminal nerve. These may appear from two to five months after a course of stilbamidine. Snapper and associates¹ have advocated the use of 2 hydroxystilbamidine, which is as effective as stilbamidine and yet does not cause this type of toxic neuropathy.

In our five patients afflicted with cutaneous and systemic blastomycosis and treated with stilbamidine, apparent clinical remission with disappearance of the organisms and regression of the lesions was achieved. Follow up of these patients, however, revealed recurrences in three. In one patient *in vitro* studies on the causative organism isolated from the patient suggest that it had acquired some resistance to the action of stilbamidine. Two of the five patients have already developed the late toxic reaction of trigeminal neuropathy.

In view of these observations and in spite of the remarkable improvement obtained with its use, stilbamidine in the present methods of its administration and dosages is still not the final answer in the treatment of North American blastomycosis. Further clinical studies are necessary.

LABORATORY STUDIES

With the demonstration of the antifungal activity of both diethylstilbestrol and stilbamidine together with their chemical similarity, the examination of compounds structurally related to them became desirable. The screening for *in vitro* antifungal activity was done by means of the serial dilution agar method in which the compound being tested was incorporated in serial dilutions of 1 mg, 0.1 mg, 0.01 mg, and 0.001 mg per cc in Sabouraud's dextrose agar. The test organisms were inoculated on these media and the concentration required for complete inhibition of growth was noted. Fifty-five compounds have been screened by this procedure. The extent of the antifungal activity of most of the compounds varied. The most promising group exhibiting consistently high activity were various nitrostyrene derivatives.¹² This group is being subjected to further investigations and soon will be given clinical trial in the treatment of mycotic infections.

SUMMARY

The aromatic diamidines stilbamidine, propamidine, and pentamidine, have been used by various investigators in the treatment of patients with mycotic infections.

Five patients with cutaneous and systemic blastomycosis were treated with stilbamidine at the University of Michigan Hospital. There was apparent clinical remission with disappearance of the organisms and regression of the lesions in all five but recurrence in three. *In vitro* studies suggested that the causative organism isolated from one patient had acquired some resistance to the drug. Two patients developed the late toxic reaction of neuropathy. It is suggested that further clinical studies of stilbamidine in the treatment of patients with North American blastomycosis be made.

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USES AND ABUSES OF ANTIBIOTICS IN THE TREATMENT OF DERMATOSES

HARRY M. ROBINSON, Jr. M.D.

ANTIBIOTICS are potent weapons with which the physician may now successfully combat some diseases for which no satisfactory means of therapy previously existed. He, however, must have a thorough knowledge of the limitations, indications, and contraindications of the antibiotic drug prescribed. These agents both by oral administration and by local application play an important role in the treatment of cutaneous diseases. The constantly changing nature of bacteria, exemplified by their development of resistance to various drugs, has necessitated constant study and research to develop new compounds. Long¹ pointed out that the majority of disease-producing strains of staphylococci are resistant to the antibacterial effects of penicillin, and it has been established that gram-positive cocci may also develop resistance to the broad spectrum antibiotics at times. These drugs are essentially bacteriostatic in action and their main function is to hold the organisms in check until the host's defense mechanisms are sufficiently strong to eradicate the infection from his body. The dermatologist must ask himself certain questions before prescribing an antibiotic: (1) Is an antibiotic really needed? (2) Can therapy with antibiotics be harmful to this patient? (3) What is the antibiotic of choice? (4) Is systemic antibiotic therapy necessary, or can a satisfactory result be produced by local applications of the drug in a suitable ointment base? (5) How long should this drug be administered? (6) Will this drug affect the patient's immune status in the future?

During the past four years we have attempted an evaluation of the antibiotics currently used in our department at this university. In order to evaluate these drugs objectively we have formed a team of four experienced board-certified dermatologists to check diagnoses and therapeutic results. Adequate use is made of all available laboratory studies prior to initiation of treatment and at the conclusion of antibiotic therapy. The social service department aids in the follow-up of those patients who would otherwise be lost from observation. I believe that such a

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Five patients with cutaneous and systemic blastomycosis were treated with stilbamidine at the University of Michigan Hospital. There was apparent clinical remission with disappearance of the organisms and regression of the lesions in all five but recurrence in three. *In vitro* studies suggested that the causative organism isolated from one patient had acquired some resistance to the drug. Two patients developed the late toxic reaction of neuropathy. It is suggested that further clinical studies of stilbamidine in the treatment of patients with North American blastomycosis be made.

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LOCAL APPLICATION OF ANTIBIOTIC OINTMENTS

The ideal antibiotic ointment is one which contains as its active ingredient a drug which is not intended for systemic administration. If a patient becomes sensitized to one of the antibiotics when it is used locally, he might also show evidence of sensitization when it is given systemically. In 1951 two cases of acquired contact sensitivity to 1 percent chloramphenicol ointment were reported.⁹ Both patients recovered from the dermatitis, but later that same year one of them was admitted to the hospital with lobar pneumonia and was started on chloramphenicol by mouth. Several days later she developed severe exfoliative dermatitis.

Tyrothricin was one of the first antibiotics developed for local use. MacLeod and associates¹⁰ and Robinson and Molitor¹¹ proved that this drug was highly toxic if administered parenterally, but many reports¹²⁻¹⁴ claimed excellent results in the treatment of the pyodermas with tyrothricin ointment. This was the first of the antibiotics which proved to be of value by local application but was not suitable for systemic administration because of the toxic side effects. As we demonstrated in our earlier studies, it was 50 percent less efficient than penicillin ointment in the treatment of the pyodermas.¹⁴ We encountered very few sensitivity reactions to this drug in our series, but Berke and Obermayer¹⁵ reported 4 percent acquired sensitivity in persons who handled the drug. Bacitracin, another antibiotic intended only for local application, produced satisfactory results in the treatment of pyodermas as reported by Miller and his associates.¹⁶ They noted an incidence of 0.5 percent sensitivity to this drug. Livingood and his co-workers¹⁷ and Kile and associates¹⁸ reported on their results with neomycin, the most recently developed antibiotic intended solely for local application. These authors stated that neomycin is less effective than bacitracin and the broad spectrum antibiotics against hemolytic streptococcal infections, but that it is the treatment of choice for cutaneous pyogenic infections except those due to hemolytic streptococci. The adverse reactions noted were believed due to the ointment base rather than to neomycin because patch tests with this antibiotic were negative.

In an earlier report¹⁴ we stated that 2 percent of the patients treated with penicillin ointment became sensitized to this antibiotic although the preparation was generally effective in producing rapid involution of the primary pyodermas and eradicating the secondary infection in other dermatoses complicated by secondary pyogenic infection. Miller and his associates¹⁹ also proved that penicillin by local application was an effective method of treating the pyodermas, but noted that 6 percent of

their patients developed sensitivity to the drug Hollander and Hardy obtained excellent results in the treatment of the pyodermas with 3 percent aureomycin ointment and these results were confirmed by Robinson and Robinson¹ The majority of the adverse reactions to local application were due to the local irritative effect of the ointment base and not to the aureomycin Apparently this drug does not readily produce sensitization by local application The results obtained by our group in the treatment of dermatoses with oxytetracycline ointment and those obtained by Wright and Tschann prove that oxytetracycline ointment is a valuable agent to be used in the treatment of the pyodermas or other dermatoses complicated by secondary pyogenic infection The adverse reactions noted in both of these series were due to the local irritative effect of the ointment base and not to the oxytetracycline While chloramphenicol ointment proved to be of great value in the treatment of pyogenic infections of the skin it produced a high incidence (4 percent) of acquired contact sensitivity We have recently reported results of our preliminary studies with erythromycin ointment It is an efficient agent in the treatment of the pyodermas and those conditions complicated by secondary pyogenic infection We have not encountered any adverse reactions in this group of patients At present carbomycin (magnamycin) is also being evaluated in our clinic both for local application and for oral administration The early results indicate that this drug is useful in the treatment of the pyodermas No sensitization reactions have been observed but the series is still small Various combinations of the antibiotics have been prepared for local use but as stated by Sulzberger and Baer it will take thorough therapeutic studies utilizing the paired comparison method to ascertain whether one of the other of these topical preparations has any particular advantage Table 1 shows a comparative study of local antibiotic therapy

We have demonstrated¹ - that the antibiotics are of great value in the local treatment of various dermatoses which are complicated by secondary pyogenic infection The fact must be emphasized however that while the secondary pyoderma is eradicated by the antibiotic ointment the underlying eczema epidermophytosis contact dermatitis atopic dermatitis or seborrheic dermatitis is not benefited The ideal antibiotic for local use is one which is effective has a low index of sensitizing power and is not intended for systemic administration

It is unfortunate that many physicians use systemic antibiotic therapy when in many instances a suitable local application will suffice This is particularly true in the case of impetigo contagiosa and ecthyma If antibiotic therapy is necessary, the drug of choice is the one which has been indicated by statistical studies to be the most efficient and the least toxic

TABLE 1 Comparative study of local antibiotic therapy

Antibiotic	Mode of administration	Efficiency in treatment of pyoderma	Production of sensitization	Ointment base generally used	Choice
Neomycin	Local use only	++++	+	Petrolatum and lanolin	1
Aur omycin	Injection oral and local	++++	+	Petrolatum and lanolin	2
Oxytetracycline	Injection oral and local	++++	+	Petrolatum and lanolin	2
Erythr mycin (arthomycin)	Oral local	++++	0 (?)	Petrolatum	2
Chloran phenicol	Oral local	++++	0 (?)	Petrolatum	2
Racetracin	Injection oral and local	++++	++++	Vanishing cream	3
Tysothrin	Local use only	++	+	Carbowax	4
Vanilacin Bacitracin	Local use only	++	+	Vanishing cream	4
Penicillin	Local use only	++	+	Petrolatum base	4
Neomycin	Injection oral and local	+++	++++	Petrolatum or vanishing cream	5
Neomycin	Injection local	+	++++	Carbowax or petrolatum	6

TABLE 4 T b p y d m

Ant b t	Eff	R l p	Ch	Ad r f f t
Aur my				
O y t y l	+	+	1	G t t t l ymptom
E h my			1	G t t t l ympt m
Carbony (m l l)	+	+	1	G t t t l ympt m
P l l m			2	G t t t l ympt m
	+	+	3	U ar
				D m t t f l t
Chl mph l	++	+	3	G t t t l ympt m
				H m t p f d g

the rest periods of a week or more in order to retain a satisfactory effect. It frequently has been possible to stop the appearance of new pustular lesions by the continued administration of subtherapeutic doses of the selected drug for a long time. When used judiciously the antibiotics have proved to be an adjunct to the therapy of acne but by no means do they replace the more standard methods in present-day use.

In dermatoses such as the various superficial mycoses, eczematous eruptions, atopic dermatitis, seborrheic dermatitis, and others which may be complicated by secondary pyogenic infection, the antibiotics will cause involution of the secondary infection but have no effect on the primary dermatosis. Diseases such as atopic dermatitis, scleroderma, granuloma annulare, and the various fungus infections as well as a host of others, are not benefited by penicillin or the broad spectrum antibiotics.

VIRAL INFECTIONS

There is no definite evidence that any of the antibiotics are of value in the treatment of viral infections. There are many contradictory reports in the literature. In the discussion of Feiler's case of molluscum contagiosum treated with aureomycin only one of the three discussants reported a similar success. Guy and associates¹ obtained a satisfactory result in their patient but the condition cleared completely in only one of our five patients.²¹ Mopper² and Niedelman³ obtained excellent results in the treatment of one patient with molluscum contagiosum with oxytetracycline but we were not able to produce a single satisfactory result in our four patients.²² In our experience penicillin, chloramphenicol, and erythromycin have also been of no value in the treatment of this disease.

It has been established that none of the currently used antibiotics are of value in the management of herpes simplex. In our large series of patients treated with the various antibiotics, it has not been unusual to observe the appearance of herpes simplex during the course of treatment with aureomycin, chloramphenicol or one of the others. Buerk and Blank⁴⁴ differed with Hyman⁴⁵ on the value of aureomycin in the treatment of Kaposi's varicelliform eruption. Hyman believed it to have been of great value in the treatment of his patient. A patient of mine received aureomycin by mouth and when she became comatose the drug was administered intravenously. This girl became progressively worse and developed encephalitis as a complication of the disseminated herpes simplex before she eventually became well. In my opinion, none of the antibiotics aided in the successful completion of her condition. This condition is self limited and it is impossible to evaluate the effect of any medication in such a disease unless the improvement is dramatic.

TABLE 4 *Thyroidism*

Antibiotic	Efficiency	Rilp	Ch	Ad	ff t
Aur my	+	+	1	G u r t l ympt m	
Oxy cycl	+	+	1	G t t t n l ymp m	
F yth my	+++		1	G t t t l ympt m	
Carb my (m ll)	++	+	2	G t t t l sympt m	
t	+		3	U t ar D m t f l t	
			3	G H m p t f d g	l sympt m

patients Livingood and associates¹⁷ demonstrated that neomycin used locally occasionally produces reactions from which *C. albicans* can be recovered. These and many other reports suggest that long continued, unbroken therapy with the antibiotics is not good practice. In chronic conditions which necessitate a long course of one of these drugs, it is suggested that the patient be given rest periods, after which the antibiotic can be resumed. ¹⁸ have demonstrated that chloramphenicol is definitely contraindicated in the treatment of chronic discoid lupus erythematosus. Two of our patients treated with this drug developed an irreversible leukopenia. In view of the number of adverse reactions which have been reported concerning chloramphenicol and the development of blood dyscrasias, it is suggested that the use of this drug be reserved for the treatment of a condition where antibiotic therapy is indicated because it has proved refractory to the other medicaments. These drugs are especially contraindicated in treatment of those persons who have developed an adverse reaction to their local application. In view of the severe gastrointestinal reactions developed by some patients taking antibiotics orally, a history of gastric ulcer, mucous or hemorrhagic colitis, or repeated attacks of gastroenteritis serves as a warning in the administration of such treatment.

SUMMARY AND CONCLUSIONS

Antibiotic therapy should only be used where there is a specific indication and the drugs should be administered in adequate dosage. Long continued systemic administration of any of the antibiotics is not considered good practice because rest periods are necessary to prevent the destruction of the natural flora of the skin. The ideal drug for local applications is one which is not used for systemic administration.

Penicillin is the drug of choice in the treatment of syphilis, but aureomycin, oxytetracycline, chloramphenicol, and erythromycin are also spirocheticidal.

The antibiotics are indicated in the treatment of the pyodermas. Local therapy will suffice in most cases of impetigo contagiosa, ecthyma, and secondarily infected dermatoses. Systemic administration is necessary in furunculosis, erysipelas, lymphangitis, and cellulitis.

All of the systemically administered antibiotics except penicillin produce healing of granuloma inguinale lesions, but to prevent relapses treatment must be continued for at least one week after all lesions have healed and the dosage must be adequate.

The majority of patients with erythema multiforme will respond to treatment with all of the systemically administered antibiotics except penicillin and streptomycin.

The antibiotics are an adjunct to the treatment of acne vulgaris but do not replace the standard method in present-day use

Antibiotic therapy is contraindicated in moniliasis gastroenteritis chronic discoid lupus erythematosus and in diseases where statistical studies prove them to be of no value and their systemic administration is contraindicated where there is a history of sensitivity to their local application

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THE FITNESS FOR MILITARY SERVICE OF PATIENTS WITH CERTAIN CHRONIC DERMATOSES

MARION B SULZBERGER *C ptai (MC) USNR*

ABOUT 39 percent of all candidates for military service at the Armed Forces Examining Center New York N Y are rejected In this center which examines about 10 percent of all inductees in the United States 10 out of every 1 000 rejections were for skin disease (table 1)

The relative hospital admission incidence of skin disease in the Army and the Navy (table 2) greatly exceeds that which might be expected when one considers that only about one per cent had been rejected for military service for various dermatoses It is probable that the number of duty days lost due to skin disease is as great if not greater than the incidence rate would indicate because the average period of disability in cases of skin disease is usually longer than that caused by other diseases

DERMATOLOGIC CONDITIONS IN THE AIR FORCE

Although figures from the Air Force paralleling those of the Army and Navy are not available at this time I have received a report on the significance of skin diseases in the Air Force which states

Dermatologic conditions (excluding dermatophytosis) rank fourth among the first 10 causes of noneffectiveness for 1951 In the number of days lost from duty this represents a mean daily patient load of 58 per 100 000 military strength The average number of days lost per case is 10.4 about the same as the year before By comparison acute upper respiratory infections rank second among causes of noneffectiveness but the average number of days lost per case is only 4.3 Although dermatologic conditions do not rank among the first 10 causes for disability partition and retirement it is interesting to note that they remain more important cause for service disconnection than the mode of perpetuity

"As a cause of hospital admission dermatological conditions (excluding dermatophytosis) rank third far above such important causes as psychoneuroses and acute gastrointestinal diseases. The death rate for dermatological conditions is negligible as in civilian life.

The statistics for 1951 again indicate that cutaneous diseases constitute one of the major causes of hospitalization and noneffectiveness in the United States Air Force."

TABLE 1 Causes for rejection of 1 000 candidates

Cause for rejection	Number
Neuropsychiatric symptoms	220
Eye ear nose or throat disease	170
Medical conditions	365
Surgical conditions	235
Skin disease	10
Total	1 000

Figure approximately

Schipper reported that the pyodermas are responsible for almost one third of all the dermatologic conditions seen in the Air Force. He emphasized that many pyogenic skin infections should be preventable with chemotherapeutic and antibiotic agents provided proper opportunities are afforded for early treatment and for the application of the effective preventive public health, and control measures which should be at the disposal of medical officers.

TABLE 2 Admissions for selected skin diseases as compared with admissions for all diseases (exclusive of battle and nonbattle casualties)

Service	All diseases (number of hospital admissions)	Skin diseases	
		Hospital admissions for	Percentage of total admissions
U. S. Navy (1929-1938 inclusive)			6.0
U. S. Navy (1952)	318 446	21 430	6.7
U. S. Army (1952)	586 493	65 196	11.0

Based on figures from the Medical Statistics Division of the U. S. Army and the U. S. Navy.
 Based on Sulzberg, M. B., McClatchy, L. K., and Parsons, R. P. Military dermatology and ophthalmology. *W. Clin. North America* 25: 1677-1698, Nov. 1941.

Schipper's statement needs no emphasis insofar as it concerns the magnitude of the problem of skin diseases in the Air Force and the loss of effectiveness which they cause. I desire to emphasize his statement that many of these conditions should be preventable and that in some the length of disability could be materially shortened by the application of correct diagnostic and therapeutic procedures which are within the capacity of the dermatologist. Dermatophytosis, however, is not included in Schipper's figures. It is probable that if such a common cause of disability as fungus infections were included, skin diseases would not rank third or fourth but possibly second or perhaps even first as a cause of disability and noneffectiveness in the Air Force.

SEPARATIONS FOR DERMATOSES

The number of separations from the Army because of disability during the year ending 30 June 1951 is also important. Of every 100 persons separated for any disability whatsoever, 19 were primarily for a skin disease. Of those separated for skin diseases, 73 percent (1387 percent of all those separated) were without compensation because the condition presumably existed prior to entry in the service. It is therefore permissible to assume that 73 percent of those being separated for skin diseases had some cutaneous defect which with optimum methods of screening might have been discovered before they were enrolled or inducted.

One need not be particularly perspicacious or a trained statistician to see the great difference between the incidence of dermatologic rejection before induction and that of dermatologic diseases in the armed services. Only one percent of those rejected at induction are rejected because of a skin disease, but from six percent to 10 percent of those admitted to the hospital in the armed services are admitted for a skin disease.

NEED FOR PERSONNEL AND EQUIPMENT

On the basis of these figures it would be appropriate to increase the number of the dermatologists in the medical corps to at least 10 percent of all the medical officers.

There is need not only for greater numbers of qualified dermatologists as medical officers but also for sufficient numbers of dermatologically well trained ancillary personnel. Only when they are available will the disability from skin diseases be materially reduced. The modern management of dermatoses demands specially trained nurses and corpsmen who can apply the technics of present dermatologic prophylactic, diagnostic and therapeutic modalities. Although it is the *sine qua non*, adequate personnel is not the only requirement for bringing about

dermatologic improvements There is an undeniable need, for example, of a properly standardized and authorized minimum dermatologic pharmacopeia in hospitals of various sizes, likewise the dermatologist needs standardized and authorized minimum equipment, instruments and apparatus for dermatologic physical therapy and minor surgery, for skin tests, and fungus studies He requires special facilities and technical equipment for a great variety of other diagnostic and therapeutic procedures just as much as does the surgeon, the radiologist, the orthopedist, or the dentist There is also an urgent need for specifying and authorizing the minimum requirements of space and basic layout for the dermatology and syphilology service in each medical military establishment

All these dermatologic necessities should be available routinely in standardized uniform fashion, as are the surgeon's operating theater, the orthopedist's cast room and the dentist's chair and drilling apparatus Their acquisition should not be left to the good will of the local commanding officers or other local authorities, nor depend upon the patience and pertinacity or the energy, aggressiveness and ability of each local dermatologist to gain them for his service The minimum space, personnel, and facilities which the exercise of his profession requires must be the dermatologist's as a routine matter not as a special favor

In specifying and authorizing these minimum dermatologic requirements, it must be borne in mind that dermatologists not only treat about 10 percent of all hospitalized patients but that they spend most of their time treating ambulatory patients in outpatient clinics There dermatologic (and venereal disease) prevention and treatment are likely to be most valuable and productive Moreover, as in certain other specialties (*e g* ophthalmology, pediatrics, and gynecology and obstetrics) a great proportion of the dermatologist's work is for the families of military personnel So much for some of the problems which are "intrinsic"—and correction of which must originate from within the service

NEED FOR RESEARCH

Another matter of great concern arises at the Armed Forces examining stations and induction centers and also might be corrected You will recall that about two percent of all disability discharges are due to a skin disease, moreover about 73 percent of these skin diseases existed prior to service These figures represent a strain on the economy of the country Every person who is discharged from the military service for a disability is entitled to the rights of a veteran, including medical care There were 2 243 hospital admissions to the Bronx Veterans Administration Hospital for skin diseases in the five years from 1947 to

1952 These figures reveal some of the continuing cost of skin diseases to the Government once affected persons have been admitted and discharged from the armed services It is incontrovertible that it would be worth while to expend considerable amounts of time effort and money to determine whether or not a greater proportion of chronic skin diseases could be discovered before the affected persons are inducted into the service

Many forms of dermatologic clinical research could be done with great accuracy in the armed services This clinical research is needed fully as much as laboratory and basic science research It is apparent as Kierland aptly stated that much has been done in the past 10 years to solve the problems of military dermatology Problems still remain and always will but with greater education and research by civilian dermatologists and those in the Armed Forces Veterans Administration and United States Public Health Service working together much may be done to alleviate the condition of those afflicted with dermatologic disease and to reduce disability and morbidity rates of diseases of the skin These are our common goals

I believe there is not a sufficient awareness of the magnitude of the problems involved of the drain on the efficiency of the armed services caused by skin diseases and of the steps which could and should be taken to reduce this tremendous cause of ineffectiveness It is our inescapable duty not only as physicians and dermatologists but as patriotic citizens to do every thing we can to bring these facts concerning dermatologic ineffectiveness to the attention of those who have both the authority and responsibility to institute the proper measures of relief

DERMATOLOGIC SCREENING

Would it not be well worth while to examine inductees more carefully for a tendency or particular susceptibility to certain skin diseases as well as for an active and at the moment an entirely incapacitating dermatosis? Should we dermatologists not attempt to introduce at the Armed Forces examining stations screening methods designed to discover latent dermatologic conditions in a manner similar to those used to discover latent psychiatric and other aberrations?

The answer to these questions could well be in the affirmative Obviously a candidate for induction need not be cyanotic or dyspneic at the moment of examination in order to be exempted from military service because of heart disease He is scientifically questioned and examined to find whether or not there are any signs indicating heart disease Similarly he need not attack the examining physician with a cleaver or try to jump out of the window of the examining station in order to be exempted because of a psychosis He is disqualified if tests indicate the

presence of a psychiatric defect which might become incapacitating later. Similarly, an ulcer need not be bleeding or perforating at the examination in order to indicate that the person is unfit for military duty.

I believe that dermatologists, just as cardiologists, psychiatrists, or gastroenterologists now do might by various modern techniques examine persons who are about to be inducted and be able to determine with some accuracy and predictability whether or not they will develop a dermatologic disability under conditions of military service. For example, if some of the inductees at several large induction centers had the following tests and examinations: (1) routine series of patch tests, (2) record of the family and personal history of atopy and of infantile eczema, (3) routine skin tests with a few selected atopens, (4) proper history for the presence of acne or pyoderma in the inductee and members of his family; (5) examination of his feet for fungi, sweat patterns, resistance to cold, friction, and maceration, and (6) test of the whole skin for its ability to sweat, its irritability, and its response to light and other physical and chemical agents. If a record of each inductee's performance on this dermatologic screening adjunct at induction and the history of these persons while in various kinds of military service were then followed, it could be determined in a few years whether or not these tests would be useful in predicting, with a reasonable degree of certainty, the military suitability of the inductee as far as his skin is concerned. This is a form of clinical research which I think we would like to see done and in which we would be glad to cooperate.

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HEALTH HAZARDS IN KOREA

The climate of Korea runs to extremes for it is subtropical in the summer and arctic in the winter. Actually it is one of the coldest climates in which Americans have ever fought. Furthermore many diseases occur in Korea to a greater extent than elsewhere. The forbidding terrain, the grossly infested soil and water as well as the general distress of the population have combined to create a background for medical and even surgical conditions without comparison in the countries from which the UN soldiers have come.

—GEORGE W. HUNTER, III Colonel MSC USA
in *American Journal of Public Health*
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THE RISKS OF PERORAL ENDOSCOPY

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THE peroral endoscopic methods—pharyngoscopy, esophagoscopy, and gastroscopy—are among the most valuable of the gastroenterologist's diagnostic aids. Unfortunately none is without its element of danger and deaths have occurred despite their skillful use by experienced clinicians. It is fair to state, however, that gastroscopy with the conventional flexible instrument has proved to be one of the safest of the major diagnostic procedures. Esophagoscopy under direct vision has too small a margin of safety for routine use by the gastroenterologist, but the recent renewed popularity of the flexible esophagoscopic obturator has provided an instrument for medical esophagoscopy which is not only of the greatest diagnostic help but also inherently as safe as the use of the flexible gastroscope.

As with many phases of medicine, the endoscopist finds that he is blamed when an accident occurs. He notes, on the other hand, that he is not criticized when he declines to carry out indicated examination or treatment under dangerous or difficult circumstances. There is no provision for public recognition of blame when a caustic stricture of the esophagus is permitted to close. The endoscopist who shuns a dangerous situation when the indications for action are clear is guilty of greater moral neglect than one who, using proper precautions, inadvertently injures the patient. The hoary admonition, "*primum non nocere*" can be a dangerous one.

PHYSIOLOGIC RISKS

Anyone who passes a tube into the esophagus must realize that in certain patients the normal autonomic connections provide for potentially dangerous esophagocardiac and gastrocadiac reflexes.¹ Insertion of a gastric tube frequently causes disturbances in cardiac rhythm in some of the smaller animals. The rate of coronary flow is diminished when the stomach is distended as it is during gastroscopy. In persons who are particularly sensitive in these respects, the mere act of swallowing, whether or not there be a tube in the gullet, periodically leads to ephemeral atrioventricular block, including complete heart block. Following pharyngitis, tonsillitis, or tonsillectomy, the occurrence of

Stokes Adams attacks coincident with deglutition is not excessively rare. Local manipulation for the control of delayed post-tonsillectomy hemorrhage has been reported as the cause of cardiac standstill and sudden death. There have been frequent reports of paroxysmal atrial tachycardia initiated by swallowing, and, of course, the degree of disability in such patients may be extreme. In most instances the history might give warning of the possibilities of these physiologic autonomic variants.

RISKS OF LOCAL ANESTHESIA

Local anesthesia is not necessary for satisfactory peroral endoscopy, but most endoscopists have found it desirable for both the patient and the examiner. The passage of a Levin tube is more unpleasant for many patients than the passage of a gastroscope, although rarely does one consider using local anesthesia for passage of a Levin tube. For many patients the sensation of postexamination oral and pharyngeal anesthesia is a most bothersome part of gastroscopy and esophagoscopy. It is not unusual for a patient, prior to a second examination, to request omission of the local anesthesia. Use of meperidine hydrochloride for pre-endoscopic sedation may preclude the necessity for local measures.¹

Peroral endoscopy under general anesthesia is considerably more dangerous than when conducted with some degree of cooperation from the patient. The psychotic patient, one with a difficult esophageal foreign body problem, or a child often requires general anesthesia but its routine use is not a gesture of kindness to the patient. For routine purposes, buccal and pharyngeal anesthesia should be used. At this hospital the agent which has proved to combine the maximum in effectiveness and safety is tetracaine hydrochloride (pontocaine). Its margin of safety is, of course, only relative.

There are two points in the oral use of tetracaine hydrochloride and of other local anesthetic drugs which appear to make the difference between relative safety and considerable danger from toxic reaction. First, barbiturates have a protective action against this form of toxicity, and one is justified in insisting on their use for pre-examination preparation. The substitution of morphine sulfate or meperidine hydrochloride for sedation prior to local anesthesia is not wise because they lack this attribute. Although Sadove and associates² stated that barbiturate prophylaxis has been overemphasized, I believe that the degree of protection afforded is of primary importance in assuring the safety of the examination. Second, use of the anesthetic solution is safer as a gargle than as an atomized spray. It is also less effective because a gargle does not reach the hypopharynx. A spray is more dangerous because a certain amount of the mist is inspired. This

increases surface contact and rapidity of absorption. Similarly in order to reduce the extent of absorbing mucosa contacted the gargle solution should not be swallowed. The toxicity of a local anesthetic drug increases geometrically with its concentration³ a one percent solution can be considered much safer than a two percent solution and the relative effectiveness is not greatly different.

There usually is no warning of a toxic reaction. A history that is suggestive will eliminate patients known to be susceptible but one cannot assume that because of a recent uneventful examination a patient is insensitive to the anesthetic agent.⁴ Patch intracutaneous and conjunctival sensitivity tests are not entirely reliable.

All patients with toxic reaction to local anesthetic drugs represent some stage in the pharmacologic sequence of overstimulation carried to the point of depression. This depression may involve the vital centers of the medulla developing simultaneously with cortical stimulation. Occasionally a sneeze is the first warning of imminent trouble and it is a good rule to have the patient immediately gargle with water to clear the throat and to prepare amobarbital sodium (sodium amytal) solution for possible intravenous use. Occasionally the patient dies suddenly. He usually stiffens, loses consciousness and slowly commences stiff atetoid movements. Deep coma slowly supervenes, respirations are decreased as cyanosis and trismus develop and clonic seizures begin. Convulsions are always accompanied by hypoxia. Respirations may cease and the patient may die in a peculiar cyanotic rigid attitude. The clinical manifestations vary from patient to patient and may occasionally be localized to an isolated reacting organ. Thus there may be only bronchospasm, or massive pharyngeal edema or sustained circulatory collapse. On occasion the reaction does not make its appearance until after the examination has begun when there is the added danger of instrumental injury.

It is negligence to use local anesthesia without a respirator and an intravenous preparation of amobarbital sodium or other rapidly acting barbiturate at hand. The treatment for most reactions includes immediate intravenous injection of amobarbital sodium. It should be given slowly and the effects observed closely at the first sign of central nervous system stimulation. It must be emphasized that barbiturate is not a therapeutic panacea and that overenthusiastic dosage may prove disastrous if the true degree of central depression is masked by cortical hyperactivity. As a further warning against the use of a large dose of barbiturate without a clear appraisal of the situation one should remember the possibility of hysterical reactions occurring in certain patients. One must be prepared to use either a respirator

or manual artificial respiration. The simple hand-bellows type of direct airway respirator is satisfactory for the purpose.

Epinephrine is ordinarily added to the local anesthetic solution to decrease its absorption by the mucosa. It is probable that a number of pre-examination drug reactions are due to sensitivity to the epinephrine, rather than to the anesthetic agent.

TABLE 1 *The incidence of local anesthetic reactions not determined in several peroral endoscopy clinics (drugs and techniques of application unknown)*

Author or clinic	Number of local anesthetics	Number of drug reactions	Fatalities
Hancock ⁴	1 150	0	0
Renshaw and associates ⁵	938	5	0
Walter Reed Army Hospital	4 350	14	0

In table 1 some experiences in endoscopy with anesthetic reactions are presented. Because the amounts, types, and details of application of the drugs are not known, the figures cannot be compared nor the incidences accepted as prophetic.

COMMON HAZARDS

Certain simple hazards arise as a result of the patient's pre-examination sedation. These are the easiest to prevent because they always involve simple carelessness. They include falls from wheel chair or stretcher when the patient is en route to the examining room and from the examining table, particularly when the patient sits up immediately after the instrument has been withdrawn. Motor vehicle accidents may occur when an outpatient is released before complete recovery from pre-examination sedation.

PERFORATIONS

In table 2 are recorded the experiences of several gastroscopists with perforation, the most dreaded of complications. In this sample tabulation, covering more than 25 000 gastroscopies, the perforation rate was 0.108 percent and the fatality rate 0.032 percent. Among the 27 perforations, 22 percent occurred through the pharyngeal wall, 41 percent through the esophagus, 33 percent through the stomach, and four percent through the jejunum (gastrojejunostomy).

TABLE 2 G i p p f i n p n t r r

Aurb li	Numbe f m	N mbe f p f	Pbary	E ph gus	S ma h	F l	R m k
S g d 20	600	5	2	3	0	3	T y l p
Schu dl	6 000	2	0	0	2	0	
A h d Coh	560	3	0	1	2	0	P r f m l g h r g h
Gulte d 12	1 200	1	0	0	1	0	
H nu g	1 400	0	0	0	0	0	
G 39	1 000	0	0	0	0	0	
M 40	1 000	0	0	0	0	0	
S h f f nd Sh f	946	2	0	0	2	0	
Fl be d J	2 800	6	0	6	0	2	T y l p
Xerth f 28	300	1	1	0	0	1	
R haw d oc	938	1	1	0	0	0	
P ul nd A 13	1 850	2	2	0	0	1	
R mbal f 2	112	1	0	0	0	0	J unum
W l d H 29	121	1	0	0	1	0	
R pp p r d F k f 34	3 000	1	0	0	1	0	
W l Reed Amy H p l	3 250	1	0	1	0	1	
T l p g	25 077	27 0 108	6	11	9	8 0 032	1 J unum

Two important questionnaire studies regarding gastroscopic accidents have been published^{4, 7} (table 3). Reports from 100 circularized gastroscopists, covering 71,351 examinations, revealed an accident rate of 0.119 percent and a fatality rate of 0.046 percent. It is noted that the British survey shows much higher rates than the American—the latter revealed only one death during 22,351 gastroscopies. This is explained by the fact that almost all of the perforations recorded in the British survey were made with the popular English Hermon Taylor gastroscope, an instrument which is very effective, but dangerous when compared with the classical Wolf-Schindler design.

TABLE 3 *Results of questionnaires regarding accidents due to passage of the flexible gastroscope*

Author	Year	Number of responses	Number of examinations	Accident	Deaths
Schindler	1940	60	22,351	10	1
Jones and associates ⁶	1951	40	49,000	75	32
Total percentage			71,351	85 0.119	33 0.046

Perforation of the esophagus is the most fearful of peroral endoscopic accidents and hypopharyngeal perforation is nearly as dangerous. Rupture of the stomach can be regarded as relatively innocuous. The results of trauma to various parts of the upper gastrointestinal tract cannot be discussed in detail, but certain aspects will be outlined.

Instrumental perforations are dangerous because they permit establishment of extramural infection. The anatomy of the surrounding tissues determines the behavior, and consequently the seriousness, of such infection. Perforations of the posterior pharyngeal wall lead to infection which anatomically is sharply circumscribed by the cervical spine and the regional fascial planes, particularly the buccopharyngeal fascia, and results in a retropharyngeal abscess. Perforations through the pyriform fossae permit infection to spread down through the pretracheal space. The common posterior perforation of the distal hypopharynx, just above the cricopharyngeus muscle, opens the way to the retrovisceral space, permitting a rapidly descending infection.

If the esophageal wall is ruptured, the resulting mediastinitis is ordinarily one of the most dangerous of infectious processes. If the esophageal wall and mediastinum have previously been

TABLE 2 G i p p f t n p n t i r r

A h l	Number f m	N b e f p f	ph ry	E p h g u s	S m a h	F l	R m a r k
S s d ²⁰	600	5	2	3	0	3	T y l p
Schu dl	6 000	2	0	0	2	0	
A h d Coh	560	3	0	1	2	0	Perf m l s h r g h
G l b e d m	1 700	1	0	0	1	0	
H m s ²⁰	1 400	0	0	0	0	0	
G ²⁰	1 000	0	0	0	0	0	
M ²⁰	1 000	0	0	0	0	0	
S h f f n d Sh p	946	2	0	0	2	0	
F l h e d J	2 800	6	0	6	0	2	T y l p
K k h f ²⁰	300	1	1	0	0	1	
R h a w d oc	938	1	1	0	0	0	
P u l n d A	1 850	2	2	0	0	1	
R u m b a l f ²⁰	112	1	0	0	0	0	J j u a u m
W l s o d H ²⁰	121	1	0	0	1	0	
R p p r e d F k l	3 000	1	0	0	1	0	
W l R e e d A m y H p l	3 250	1	0	1	0	1	
T l P	25 077	27 0 108	6	11	9	8 0 032	1 J j u a m

anterior longitudinal ligament of the spine. It covers the anterior aspect of the prevertebral muscle mass to form the posterior limit of the retrovisceral space. Laterally it joins the carotid sheaths and the fascias of the scalenus anterior muscles and of the superior portion of the posterior cervical triangles. The prevertebral fascia forms the natural posterior limit to infections resulting from hypopharyngeal or high esophageal perforations.

The pretracheal fascia extends inferiorly from the submaxillary fascia, covering the anterior aspects of the trachea and thyroid gland. Laterally, it is continuous with the carotid sheaths. Below the thyroid isthmus the sheath contains the inferior thyroid veins. Inferiorly, the fascia joins the posterior aspect of the pericardium. The pretracheal fascia is loosely attached to the trachea and thyroid gland, producing the important potential pretracheal space. This space extends inferiorly to the pericardium, and its upper limit is marked by its junction with its posterior counterpart above the thyroid gland. Perforation of the anterior esophageal wall first reaches the pretracheal space, and resulting infection may quickly follow the space down into the thorax. Infections which extend through the pyriform fossae also reach this space directly, according to the findings of Seybold and associates.⁴

The plane of the buccopharyngeal fascia lies between these two fascial layers. It stretches from carotid sheath to carotid sheath behind the esophagus, and thus forms the anterior limit of the retrovisceral space. It clothes the posterior aspect of the pharyngeal constrictors, and extends forward to cover the buccinator muscle. Superiorly it attaches to the base of the skull, and continues down into the superior mediastinum.

The two carotid sheaths enfold the common and internal carotid arteries, the internal jugular vein, and vagus nerve. They extend from the base of the skull down to the base of the neck. The other cervical fascial sheaths make direct or indirect connections with this pair of sheaths.

HYPOPHARYNGEAL PERFORATIONS

Approximately one quarter of gastroscopic perforations and the majority of esophagosopic perforations occur proximal to the cricopharyngeal muscle. Remarkably large objects easily pass through this region if the normal mechanism of deglutition has been brought into play. The cricopharyngeal muscle, however, remains in a state of tonic contraction except momentarily at the conclusion of the buccopharyngeal phase of swallowing. Unless an instrument be insinuated directly into the potential lumen, it cannot pass without doing injury to the mucosa. An endoscope passed blindly, without conscious help from the pa-

tient is likely to perforate on the side of the contracted muscle. The pyriform fossae form a special hazard and these recesses may catch the tip of an endoscope and fail to release it as pressure is applied.

The anatomic hazards are largely eliminated during deglutition when the local musculature contracts the hypopharynx and releases the cricopharyngeus. For this reason peroral endoscopy is more dangerous in the patient with general anesthesia. Similarly—and rather paradoxically—in the conscious person blind instrumentation is safer than instrumentation under direct vision. This has led the esophagoscopist to adopt again the flexible obturator to assist in traversing the pharynx. The patient who is awake but whose throat is anesthetized has difficulty when requested to swallow because his neck is extended, fingers and instruments are in his throat, and the trigger points from which the deglutitory stimulus arises (Pommerenke's areas) have been anesthetized. Nevertheless the patient by conscious effort is able to go through the motions of swallowing and this is sufficient.

This explanation for endoscopic dangers in the hypopharynx has not been unanimously accepted. Goligher believed that cricopharyngeal muscle tone does not enter into the problem because in the reports of perforation there has seldom been mention of difficulty in passing the instrument. Rather he postulated one must consider the relative sparsity of muscle in the posterior wall of the distal hypopharynx. The lower borders of normal cervical vertebral bodies are prominent and rough. Pressure transmitted through the thin pharyngeal wall against these prominences must put a severe strain on tissue continuity. Schindler believed that the rubber finger which is fitted to the tip of most modern gastroscopes and esophagoscopic obturators is important in protecting the hypopharynx by transmitting the pressure of the instrument's tip over a relatively large surface. Whatever the technic of endoscopy may be, local disease, particularly Zenker's diverticulum, even though its presence may be known, contributes a distinct hazard.

Injury may not be suspected for a considerable period after instrumentation, for example more than 30 hours elapsed in one instance and four days in another.¹¹ Bisgard and Kerr¹² on the other hand observed the pharyngeal perforation through the esophagoscope in two cases. Goligher was warned by noting blood on the gastroscope after it had been withdrawn from a patient who had had a coughing spell during an otherwise easy introduction.

Sore throat, deep neck pain, and fever are the usual early manifestations of perforation. Subcutaneous emphysema may appear

within three hours, but its occurrence following perforations at this level is a bit difficult to understand. One can merely assume that the sudden increase in intrapharyngeal pressure during deglutition forces the air, which accompanies swallowed saliva, out into the tissues. Erythema characteristically spreads very rapidly. Paul and Antes¹¹ described the development of puffiness of the face, eyes, neck, and upper chest within six hours following instrumentation. Separation of the posterior pharyngeal wall from the spine by rapidly progressing inflammatory reaction may produce obstructive phenomena, and dyspnea is not a rare complaint.¹² Acute inflammatory toxicity also quickly develops. A retropharyngeal abscess in one of the patients studied by Bisgard and Kerr ruptured spontaneously on the sixth day, leading to sudden death by aspiration.

Because of the intrathoracic extension of the retrovisceral space, it is of paramount importance that the region be drained as soon as a hypopharyngeal perforation is recognized. Medical treatment is adequate only in a rare instance, and a few hours delay in surgical drainage is often a fatal mistake. In the patient examined by Knox,¹⁴ delay was blamed for the persistence of a chronic fistula. The classical von Hacker superior mediastinotomy is ordinarily the surgical approach of choice. Occasionally at operation no perforation can be found,¹⁵ but most surgeons¹² have made a determined attempt to find and to close the defect, which ordinarily is a transverse split. One wonders whether such sutures can possibly hold more than a few hours, but the important part of the treatment is obviously not the closure but early and adequate drainage.

ESOPHAGEAL PERFORATIONS

Of 19 instrumental perforations of the esophagus reported by Seybold and associates, 17 occurred through the cervical esophagus and two through the distal portion. This distribution tendency has been observed following both direct-vision and blind instrumentation.⁴ The vulnerability of the segment immediately distal to the cricopharyngeal muscle is not understood. Rarely can local disease be incriminated, but Asher and Cohen¹⁶ believed that carcinoma of the thyroid gland was responsible in their patient. White¹⁷ postulated that he had merely abraded the esophageal wall at the natural point of contact posteriorly and that infection had then extended transmurally. He based his contention on the fact that the patient did not become ill until four days after gastroscopy. In the instance reported by Paul and Lage,¹⁴ a fulminating mediastinitis quickly developed and death followed gastroscopy in only 24 hours yet no perforation could be found at autopsy.

Touroff's⁷ experience in the cervical esophagus was unique and is worth quoting: "after the instrument (gastroscope) had been passed downward apparently without difficulty for a distance of about six inches beyond the upper incisor teeth (in a 40-year old man) a small amount of blood was noted in the patient's mouth. The instrument was withdrawn immediately and it was noted that the flexible rubber bougie at the distal end of the apparatus was missing. Within a few moments the patient began to complain of pain over the right side of the neck and palpation disclosed tenderness and crepitation in that area. Swelling quickly followed and roentgenograms showed extensive collections of air in the cervical tissue planes and in the retropharyngeal and retroesophageal space. On the right side opposite the lower cervical and first dorsal vertebrae the missing bougie was seen with its tip pointing cephalad. Immediate operation permitted recovery of the foreign body. The laceration was in the right posterolateral wall and its edges were everted, bruised and ecchymotic. The patient recovered."

In studying published reports one is impressed by the fact that few of the authors became immediately cognizant of the injury incurred during the examination. Witherspoon⁸ stated the gastroscope was passed easily into the stomach. The patient's immediate condition following the gastroscopy was satisfactory. White⁹ reported gastroscopy was performed the patient being fully co-operative and the instrument passing easily. Paul and Lage¹⁰ The instrument (gastroscope) was passed with ease. "Fletcher and Jones¹¹ The Hermon Taylor gastroscope was introduced without any difficulty and afterwards the patient sat up and commented on the complete absence of any discomfort. The pre-examination use of intravenous meperidine hydrochloride was believed by Cimoch and Wirts¹² to have been responsible for masking and preventing pain, unusual sensation or shock in their patient with perforation of the distal esophagus. Such experiences are alarming and demonstrate the necessity for adequate postexamination observation particularly of outpatients."

A large proportion of reported accidents have occurred in women past 50 years of age. Besides esophageal disease and age the common predisposing factor is spinal deformity. Rather extensive studies have shown that in some patients with kyphosis and scoliosis the mediastinal structures follow the deformity but in others a short cut is taken across bowed regions. In one of Fletcher and Jones' patients with scurvy and kyphosis the Hermon Taylor gastroscope was manipulated through a difficult passage by control of the directable tip. Strong and associates¹³ proceeded cautiously in a patient with kyphosis and discontinued the procedure when resistance was felt in the midesoph-

agus, nevertheless, severe shock and emphysema developed in two hours, and later, empyema

Dysphagia, fever, emphysema, cervical swelling, forward displacement of the trachea by retrovisceral gas and edema, dyspnea, cyanosis, tachycardia, and collapse are the common manifestations of spreading mediastinitis. If by chance the perforation is directly through the parietal pleura, the situation is more favorable (fig 2). The mediastinum then may drain spontaneously into the pleural cavity. The result is a hydropneumothorax, usually on the right side, which is replaced later by pyothorax.

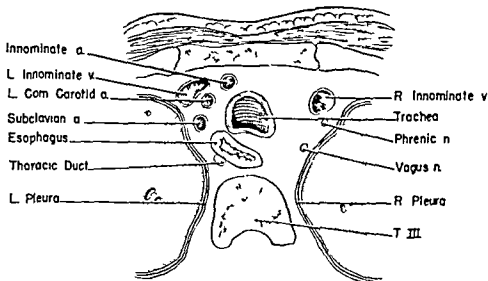


Figure 2. Relation of esophagus to pleura at the level of the third thoracic vertebra.

Treatment for esophageal perforation with mediastinitis is immediate thoracotomy and mediastinal drainage. The von Hacker superior mediastinotomy approach can be relied on to take care of infections no lower than the level of the fourth thoracic vertebra. Mediastinal packing is probably contraindicated as ineffective in encouraging localization. An occasional patient has recovered on conservative medical treatment,^{19, 20} but no I have died within 11 days of endoscopy when treated only by medical means.^{7, 2} When there has been free perforation into one of the pleural cavities, and auscultation and radiologic study fail to show mediastinal emphysema or mediastinal widening, the surgeon may for the moment choose only to drain the chest with an indwelling catheter attached to a water sealed bottle. If this is the decision, however, it is most important that radiologic examination be repeated at hourly intervals for several hours so that the need for thoracotomy and mediastinal drainage may be recognized without delay.

The process of removing tissue from the esophageal wall for biopsy is simple quick and reasonably safe Puncture with the biopsy forceps however may occur because the tissue taken is in a diseased region The accident may not be evident to the endoscopist at the time

PERFORATION OF THE STOMACH WITH THE GASTROSCOPE

When the gastroscope is lowered into the stomach it comes into contact first with the posterior wall close to the lesser curvature just below the cardia A perforation at this point would enter the lesser peritoneal sac The possibility of causing damage here however is remote unless the stomach wall is diseased Although the mucosal folds in the region tend to run across the path of the advancing instrument the surface mucus configuration of the tip of the instrument flexibility of both stomach and gastroscope and oblique angle of contact permit introduction with little friction It may be as Schindler¹ and Schindler and Renshaw² have reiterated that the rubber finger at the tip of the gastroscope protects the stomach wall by providing a flexible sliding surface with distribution of transmitted pressure The older type of sponge tip was dangerous but as far as gastric injury is concerned many gastroscopists believe that the ball and bullet tips are as safe as the rubber finger Rubber fingers have been made out of various grades of natural and artificial rubber and some of the latter are almost rigid

One of the strangest of gastroscopic phenomena is the passage of air through the gastric wall without a demonstrable wound Several cases have been reported and because presumably minor degrees of pneumoperitoneum may occur from time to time without clinical symptoms it is conceivable that this may be a relatively common sequel to gastroscopy Myhre and Wilson³ made a study of this possibility by taking upright roentgenograms of the abdomen of 119 patients 24 hours after routine and apparently uneventful gastroscopy They found no typical instance of pneumoperitoneum but in two patients encountered evidence of *interstitial emphysema of the gastric wall—complications which would have remained undetected without the routine roentgenograms*

The problem of gastric perforation can best be visualized by these recorded experiences

Schindler¹ In a 40-year-old man the gastroscope with rubber finger passed easily Air was inflated after deep introduction and dark red mucosa unfolded briefly then the stomach collapsed and could not be inflated For a fleeting moment a gray-white surface was seen The diagnosis of a perforation was made at gastroscopy Laparotomy three hours later disclosed no perforation It must be assumed that

Berk ²⁴ Gastroscopy was "accomplished without difficulty. The mucosal details were seen after inflation but the stomach, however, could not be kept inflated and collapsed repeatedly immediately after inflation. The patient felt no pain but complained of fullness and tightness. Vital signs and white blood count were normal. Twelve hours after the examination the patient complained of sudden excruciating abdominal pain and chills. Laparotomy was performed 14 hours after gastroscopy but except for free air no abnormalities were found. Recovery was uneventful.

Chamberlin ²⁵ In a 42 year old man with a large ulcer on the lesser curvature the gastroscope was passed with ease but the stomach was difficult to inflate. When the instrument was removed the patient belched but did not complain of pain. The instrument was passed again but the stomach could not be inflated. The abdomen was distended but the patient was unable to belch. He was dizzy but had no other complaints. Scrotal emphysema appeared later that day and an examination of the blood disclosed a leukocyte count of 20 000. Laparotomy performed about 12 hours after examination revealed air but no free fluid and emphysematous blebs were found along gastric lesser curvature and in retroperitoneal tissue over the aorta. The ulcer was removed by wedge resection. Carotid sheath and suprapubic emphysema were still present the following morning. Pneumoperitoneum was explained by diffusion of air through the thin ulcer base and the neck and scrotal emphysema by passage of air along lymphatic and blood vessels of the stomach wall.

Schiff and associates ² 77 year old man. The instrument was readily passed. The stomach was inflated with air in the usual manner. * Visibility was excellent throughout the entire examination. The peritoneum was not seen nor was there any sudden deflation of the stomach. The patient remained well. On the fourth day pneumoperitoneum was noted at fluoroscopy.

Bergh and associates ²⁷ The case from our clinic showed pneumoperitoneum on x ray examination but failed to develop any signs of peritonitis and recovered completely without operation.

Gilbert and associates ⁸ When the gastroscope was passed in a 71 year-old man a fleeting glance was obtained and then the stomach collapsed. It was not possible to inflate it again and light did not shine through the abdominal wall. The patient though without actual pain, felt distended and was unable to belch. At exploration air was found but no blood or soilage was present. Emphysematous blebs were present in the gastrohepatic ligament. No perforation could be found. The stomach was filled with water but none could be squeezed through its wall.

Wilson and Haas ²⁹ In a 69-year-old man, the gastroscope passed easily but the stomach was never visualized and could not be inflated. The patient had no complaints and ate lunch 24 hours later.

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sac, where it is easily found by both physical and roentgenographic examination. In figure 3 the right lateral limit of the lesser sac is seen as it is outlined by air. The familiar anatomic extent of the distended greater sac is shown in figure 4.

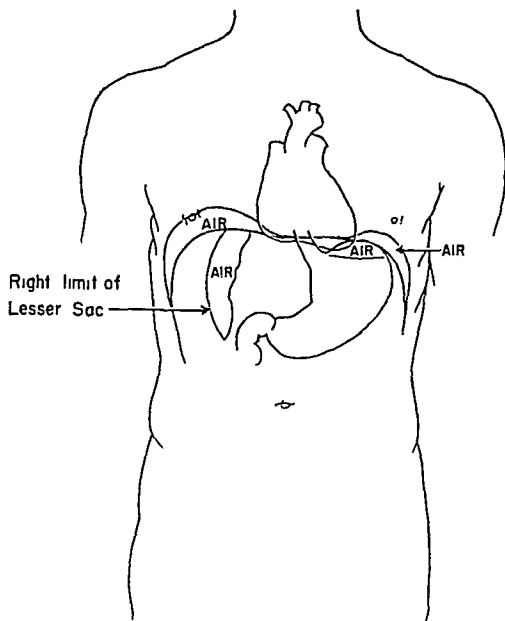


Fig. 3. Distribution of free abdominal air upright position showing right lateral limit of the lesser sac.

Small quantities of air may be absorbed by the peritoneum within 24 hours. As judged by roentgenologic examination, at least 14 days are required for absorption of quantities in excess of 1,200 cc.

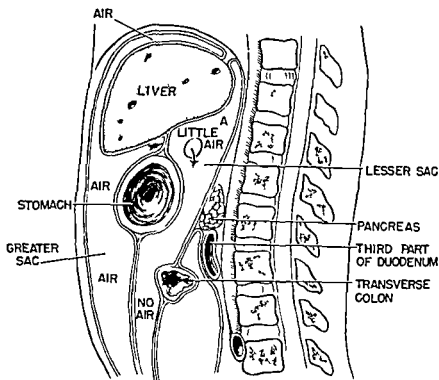


Fig. 4. Distribution of free abdominal air following perforation of the stomach and the communication of the air to the lesser sac.

TREATMENT OF GASTRIC PERFORATION

It is now believed that in nearly all cases of gastroscopic perforation of the stomach the proper treatment is conservative consisting of constant gastric aspiration for five days antibiotic therapy and adequate sedation and analgesia. The stomach is empty and significant peritonitis is not expected. The massive pneumoperitoneum which usually has been induced before perforation becomes apparent should be released and this is accomplished by needle puncture of the abdominal wall.

As a generalization I believe that gastroscopic perforation of the stomach is a remarkably benign accident and that emergency laparotomy is more often harmful than helpful. The inability of the surgeon to find the perforation even with the help of vigorous gastric inflation and dye instillation has often occurred. Many such patients have been explored but nearly all have had to be closed without anything useful accomplished.

PERFORATION OF JEJUNUM

Even in the immediate gastric postoperative period gastroscopy is a relatively safe procedure. The operator need not worry

about the suture line. It has been only one operative stomach. He had had a modified Pouch months previously. The operation was uneventful. Now the patient has no pain or discomfort. The gastroscope was believed to be in the stomach. The instrument was withdrawn and found in the stomach. The patient complained of discomfort. He returned that evening. The examination showed free air. The procedure was performed, and an 18-mm. Pouch was found. The aspect of the jejunum two inches did not develop.

HEMORRHAGE FOLLOWING

Hemorrhage is an extremely rare complication. Howard¹¹ reported an instance in which the scope was easily introduced into the stomach but dark redness of the mucosa could be seen, even though the instrument was withdrawn and the scope was passed again and there was no bleeding. The examination was found. That evening the patient vomited blood. Howard concluded that the failure to lubricate the scope traumatized the mucosa, which had been inhibited with atropine.

A similar situation has been reported. Gastroscopy was performed on a patient with chronic dyspepsia. There had been no bleeding from the gastrointestinal tract. Eleven hours after gastroscopy the patient was nauseated and shortly vomited a large amount of blood. He was hospitalized and evidence of active bleeding was found. Fusion was required.

LEGAL RISKS

The legal risk to diagnostic gastroscopy is negligible and there are few legal objections to these procedures. The contraindications are standardized but it must be emphasized that it must be balanced against the risk of a large aortic aneurysm or other

complications of gastroscopy.

It is important to remember that the risk of a large aortic aneurysm is not negligible.

96.

for endoscopy unless there be a foreign body in the esophagus. Roentgenographic studies of the esophagus are a matter of customary legal necessity prior to peroral endoscopy except under conditions requiring quick action such as massive upper gastrointestinal hemorrhage of unknown origin. The precedent for direct visual intubation of the esophagoscope if there is no prior information about the organ has been well established. Blind esophagoscopy under these conditions might be regarded with legal disfavor. Preparations for the treatment of anesthetic reactions must of course be available at all times in the endoscopy room.

SUMMARY

Peroral endoscopic procedures are carried out with a calculated risk. The risk however can seldom be considered as great as that which may accrue if endoscopy is omitted when the indications for it are clear.

There are some important dangers which are not the direct consequence of instrumentation itself. Toxic reaction to local anesthetics although rare is an emergency which demands prompt and intelligent treatment directed at mixed central overstimulation and depression. The patient's history may forewarn of the possibility of inducing cardiac arrhythmia by peroral manipulations. Following preparation for endoscopy the patient requires protection from simple accidental trauma.

Perforation of the pharynx or esophagus is a grave catastrophe requiring immediate surgical intervention. Gastroscopic rupture of the stomach on the other hand is not necessarily an indication for laparotomy. The behavior of postperforation infection is determined largely by the regional fascial or peritoneal anatomy as the case may be.

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ARMY MEDICAL SERVICE ANNOUNCES SERIES OF SHORT POSTGRADUATE COURSES OPEN TO ALL PHYSICIANS

Beginning on 23 August 1954 a series of short postgraduate courses in selected clinical specialties will be conducted by the Army Medical Service in Washington D C San Antonio Denver and San Francisco Enrollment is open to medical officers of the Army Navy and Air Force either on active or inactive duty and to physicians in other Federal services or in private practice

The courses will be offered on two qualification levels Level I includes board-certified or board-qualified officers chiefs or assistant chiefs of hospital services or medical officers well advanced in the study of their specialty Included in level II are officers partially qualified in a specialty and ward dispensary officers responsible for medical treatment in a specialty The following courses will be conducted

Walter Reed Army Medical Center Washington, D. C. The Joint Committee on Medical Education
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 with Emphasis on Thoracic and Vascular Surgery 20-25 September I I I d II R
 Adm. and Ophthalmology 24 February 1955 I I I d II P h l g y f h O l
 1. Gynecology and Obstetrics 9-14 May 1955 I I I d II

Armed Forces Institute of Pathology Washington, D. C. Pathology Department
 1. Laboratory Medicine 18-22 October I I I and II F Pathology 15 November I I I
 d II Ophthalmology Pathology 7-11 February 1955 I I I d II Pathology f h O l
 1. Radiology 14-18 March 1955 I I I and II, d Appl f H t h m try t P h
 1. Gynecology 2-4 May 1955, I I I d II

Fitzsimons Army Hospital Denver Colorado Psychology Department 23-28 August
 1. I I I and Symposium on Pulmonary Disease 13-17 September I I I d II

Letterman Army Hospital San Francisco California Radiology Department
 1. Radiology 11-16 October I I I

Brook Army Hospital San Antonio Texas Obstetrics and Gynecology 23-26 March
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Army Medical officers on active duty and civil service physicians should submit applications to The Surgeon General Department of the Army and Reserve officers to the Army area commander where assigned National Guard medical officers should make application through the National Guard Bureau Washington 25 D C. and medical officers from other services through normal command channels Physicians from other Federal agencies and civilian physicians should apply directly to the commander of the installation offering the course

COMPARISON OF THYROID FUNCTION TESTS

BENEDICT J DUFFY Jr *Lieutenant (MC) USNR*
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THE measurement of the concentration of radioiodine (I^{131}) in the thyroid gland and the chemical determination of the protein bound iodine (PBI) of the blood serum are laboratory tests that have gained increasing use in the diagnosis of thyroid disease. The purpose of this report is to compare I^{131} and PBI determinations in a group of patients referred for evaluation of their thyroid function, and to contrast these tests with the determination of the basal metabolic rate.

I^{131} AND PBI IN EUTHYROID AND HYPERTHYROID PATIENTS

I^{131} Concentration in the thyroid gland was measured one hour and 24 hours after the oral administration of 10 microcuries of I^{131} . The patient was in the fasting state to facilitate the one hour screening determination of I^{131} . A careful history of any previous intake of desiccated thyroid, iodine-containing medication, or iodized oils used in roentgenographic diagnosis was obtained to rule out these sources of error.

PBI Six centimeters of blood was drawn into an iodine-free tube and the PBI was determined by the method of Brown and associates,¹ with minor modifications. This method enables our technician to make up to 12 determinations daily in duplicate. The same iodine compounds which interfere with the I^{131} tests adversely affect the determination of PBI.

The I^{131} and PBI test results in 50 euthyroid and in 25 hyperthyroid patients are shown in figures 1 and 2. In the normal patients more than 97 percent of the results were between the limits of five percent and 45 percent I^{131} concentration, and 100 percent were between 3.5 and 8.0 PBI gamma per 100 cc of serum. In the hyperthyroid patients, I^{131} concentration was between 50 percent and 85 percent in over 94 percent of the cases while in all cases the PBI per 100 cc of serum was between 8.0 and 16 or more. Despite the expected overlap between the higher normal and lower

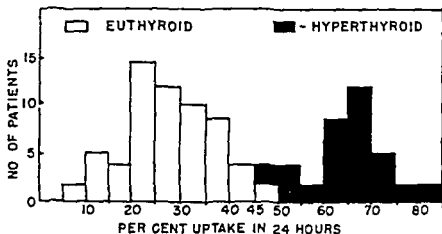


Fig 1. Concentration of I^{131} uptake in 24 hours in euthyroid and hyperthyroid patients.

hyperthyroid readings there was clear cut separation between the euthyroid and hyperthyroid groups with both tests

COMPARISON OF ONE HOUR AND 24 HOUR UPTAKE OF I^{131}

One of the limitations of the 24-hour test of thyroid concentration of I^{131} is the requirement that the patient return to the laboratory for a neck count on the day following the administration of the tracer. We have therefore tested the value of the one-hour fasting uptake of I^{131} described by Crispell and associates as a simplified technic for the diagnosis of hyperthyroidism. We agree

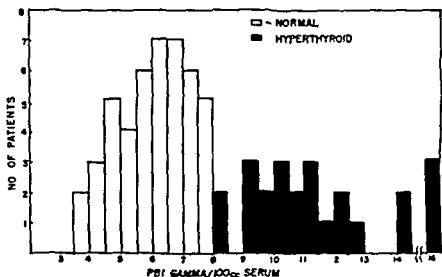


Fig 2. PBI determination in euthyroid and hyperthyroid patients.

with them that this test is not useful in the diagnosis of hypothyroidism

Figure 3 is a comparison of the one-hour and 24 hour uptake in a group of euthyroid and hyperthyroid patients. The thyroid status of these persons was further confirmed by use of the PBI test. In our results the one-hour fasting uptake compares favorably with the 24-hour uptake

BASAL METABOLIC DETERMINATIONS IN EUTHYROID PATIENTS

One of the most frequently used and abused, tests in clinical medicine is the determination of the basal metabolic rate (B M R). While the reliability of the test has been repeatedly questioned it is still widely applied as an index of thyroid function

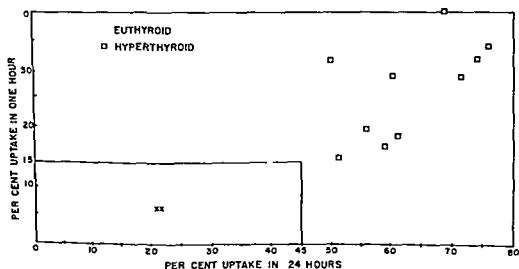


Figure 3 Comparison of one-hour and 24-hour thyroidal uptakes of I^{131} in diagnosis of thyroid function.

Figure 4 illustrates the determinations in over 50 euthyroid patients referred to us. The B M R tests were performed in hospitals according to a standard procedure. Where the tracing was demonstrably faulty it was discarded and the test repeated. These results appear to confirm the repeated observations of others^{3, 4} that a single B M R determination has limited value in the diagnosis of thyroid function. Kyle, in a comprehensive review on this subject, cites Silver and associates⁵ to the effect that as a test the B M R is not only "a poor adjunct to clinical judgment, but one which is affected by many factors other than thyroid hormone."

With full realization that it will take time to displace this venerable technic, we believe that the hospital facilities, technical help and expense involved in doing B M R determinations

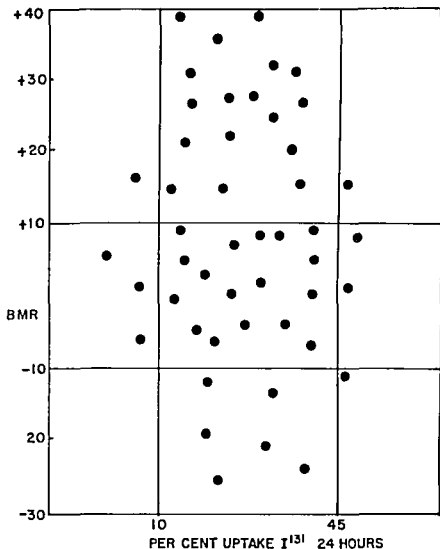


Fig. 4. Comparison of BMR and I¹³¹ uptake in euthyroid patients.

would be better expended in the more objective and reliable tests of thyroid function namely the I¹³¹ and PBI tests

SUMMARY AND CONCLUSIONS

The 24 hour I¹³¹ thyroidal uptake and the PBI determination of the serum are practical reliable and comparable clinical tests of thyroid function in euthyroid and hyperthyroid patients

The one-hour I¹³¹ uptake test in the fasting state is a valuable screening test for hyperthyroidism

The B M R test is of limited value in the diagnosis of thyroid function

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TELLING THE PATIENT

On the part of the physician there is an unbelievable misconception of the medical sophistication of the average citizen. Led astray by the many medical articles in the lay press the physician often feels uncomfortable that the patient is a short step behind him in medical knowledge and is literally panting down his neck. Because physicians need to be secure and because it is necessary to impress the patient with their ability they discuss the medical aspects of the patient's problem in terms completely unintelligible to the patient. Probably psychiatry has led the field in contributing supposedly scientific terminology to the vernacular of the populace. A tremendous amount of scientific knowledge is necessary to understand even the simple medical problems. Yet physicians often blithely assume that they are talking to a contemporary specialist in the field and therefore explain complicated medical and surgical problems to patients in such a way that they are entirely incomprehensible. In internal medicine they discuss with patients the developments in steroid chemistry which may be expected next month while in surgery they discuss renovations and rearrangements of the upper part of the abdomen which could reasonably be expected to baffle an anatomist. But the patient so glad for the personal attention and the camaraderie expressed by such an interview expressed by such an interview nods his head sagely forms a hundred misconceptions and finally comes to the conclusion that whatever is wrong with him is certainly awful and is only equalled in complexity by the cure that is being proposed.

DAVID A. BOYD, M.D.
in *Wisconsin Medical Journal*
p 171 Feb 1954

SIMPLIFIED PULMONARY FUNCTION STUDIES

Use of a Waterless Basal Metabolic Apparatus and Respirometer

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PULMONARY function studies in clinical medicine have become increasingly important in the past decade because of their contributions to our knowledge of chronic pulmonary disease with functional insufficiency. Physical examination and roentgenography are limited in profiling pulmonary disability and specific function studies are necessary to evaluate the disease process adequately. Wright and Filley's observations provide an excellent document on this fundamental fact.

In military medicine special considerations are encountered in evaluating the patient with chest disease whether it involves the musculoskeletal system, lungs, diaphragm, heart, pulmonary circulation, or combinations of these systems. Duty responsibilities may require sudden changes in environment which produce epidemiologic hazards. There may be sudden changes in the type of activity between the extremes of full field exertion to a sedentary type of office assignment. Determination of the pulmonary function prior to retirement is mandatory in many patients who are referred to a physical evaluation board. The use of such tests as evidence in board proceedings has been almost entirely neglected. It has been our experience that physical examination and roentgenography are limited and often unreliable in estimating lung function status for disability rating.

There are many methods of measuring pulmonary function. Various techniques, recommended equipment, and interpretations have been explained in detail in standard texts and recent publications.¹ The procedures of ventilatory studies are found only by reading countless references published over a number of years and a comprehensive review of this material which will spare the reader much time in organizing his program of ventilatory study is indicated. We are engaged in a study to provide a functional classification of pulmonary insufficiency for disability rating based on physiologic study. This present article

F m W I R d A m H p I W h g D C

describes a method for using the conventional type of respirometer and a waterless basal metabolic machine in external spirometry. The benefits of past experience are also reviewed, and modifications and values developed from our research are presented.

VALUE OF EXISTING METHODS

Current writings on pulmonary function have emphasized studies designed to measure ventilation perfusion relationships. The principles and mechanics of these studies are complicated and the necessary facilities are usually not available to the majority of practicing physicians. To carry out such studies special laboratory facilities, expensive apparatus, and technicians with specific training are required but the difficulty of meeting these requirements sometimes produces a defeatist attitude toward pulmonary function studies. Most physicians believe that pulmonary function cannot be adequately evaluated without oxygen and carbon dioxide diffusion distribution studies and pulmonary blood flow data. Confusion has arisen between the objectives of clinical evaluation and physiologic investigation between techniques for the collection of physiologic data and procedures for clinical evaluation of pulmonary function.

The elaborate and excellent work performed in many physiologic laboratories is the stimulus for future clinical application. Shortcomings of simplified clinical studies are demonstrated, and additional functional changes are documented and more specifically localized as to the site of involvement and mechanisms. These studies supplement our total of information and do not render available clinical techniques obsolete. The wealth of information derived from ventilatory studies and spirometry should neither be neglected nor fall into disuse.

Since the time Hutchinson first described the vital capacity,²⁰ specific simplified techniques have been developed. The majority are easy to use, are executed in a short time, necessitate a minimum of inexpensive equipment, offer a high degree of accuracy, and include most of the functional aspects of pulmonary ventilation. Properly used and carefully evaluated along with the basic clinical survey of a complete history, physical examination, and roentgenographic study, they will provide data on most of the problems encountered.

TYPES OF PULMONARY FUNCTION

Physiologically and anatomically pulmonary function can be divided into two broad categories: ventilation and respiratory gas exchange. The function of ventilation, or the volume displacement of gases between the atmosphere and the lung interior, includes (1) the muscles of respiration, (2) the supportive structures represented by the bony and cartilaginous rib cage, the shoulder

girdle the abdominal muscles, the vertebral column the mediastinum and the pleura (3) the lung parenchyma (4) the tracheobronchial tree and (5) the entire nervous apparatus affecting the ventilatory process

Principal ventilatory defects are obstruction and restriction. Obstruction is characterized by air flow resistance within the respiratory tree tissue flow resistance involving the chest wall and lungs and the resistance of tissues to changes in configuration. It is manifested clinically by dyspnea with expiratory wheezes and ronchi. Restriction is characterized by reduction in the total pulmonary volume and is manifested by dyspnea without expiratory wheezes and ronchi.

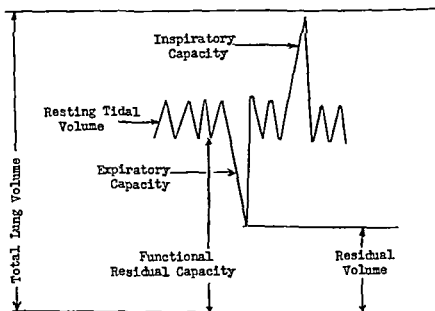


Figure 1 Subdivisions of lung volume

Respiratory gas exchange the second category of pulmonary function is the process of oxygen and carbon dioxide exchange between the blood in the pulmonary capillary and the atmosphere. Its function is the effective distribution of inhaled gases to the functioning alveoli their effective diffusion across the alveolocapillary membrane and the maintenance of adequate volume and flow rate of pulmonary blood.

THE LUNG VOLUME AND ITS SUBDIVISIONS

In the past lung volume measurements were made with difficulty because of conflicting concepts regarding subdivision of the total lung volume. The concepts and nomenclature proposed

by Christie¹³ are now generally used.²¹ Subdivisions of the lung volume and corresponding definitions were established as follows (fig 1)

Resting respiratory level or midpulmonary position The point of reference from which all measurements are taken, and the pulmonary position to which the thorax returns at the completion of a quiet basal respiration

Tidal air The average volume of air moved in and out of the chest during ordinary respiration at any level of activity

Inspiratory capacity (formerly "complemental" air) The maximum volume of air inhaled from the end of an ordinary expiration

Expiratory reserve (formerly "reserve" or supplemental" air) The maximum volume of air exhaled from the midpulmonary position

Vital capacity The volume of the inspiratory capacity plus the expiratory reserve, or the total amount of air exhaled after a maximal inspiration

Residual air The volume of air which remains in the lungs after maximum expiration, made possible by the negative intra thoracic pressure which prevents collapse of air cells

Functional residual air The amount of air remaining in the lungs at the end of a normal expiration, the sum of the expiratory capacity plus the residual air

PRELIMINARY PROCEDURES

Calibration of the spirometer Commercially purchased respirometers are usually calibrated, ordinarily however the bell or bellows type for metabolic determinations is not calibrated. A schematic diagram of equipment arrangement for volumetric determination of bellows expansion, or bell rise, along the vertical is shown in figure 2. A known volume of water under known temperature and pressure, displaces an equal volume of air from the water bottle into the bellows. This simple procedure provides a means of establishing the exact volume of gas represented by each centimeter displacement of the recording stylet along the vertical. From the results, the value of the constant "K" in the formula, liters gas = $K \times$ (millimeters rise of the bell), is obtained

If the cross section of the bellows is uniform at all levels there will be a direct linear relationship between the changes in the volume of gas in the spirometer to motions of the bell or bellows along the vertical. If the cross section of the bell is not uniform at all levels the result will be a variation of "K," and a correction curve must be plotted indicating gas volumes corresponding to different scale readings. A linear relationship between the

volume of gas in the spirometer to the motion of the bell is apparent when a counterpoise to balance the weight of the bell exactly at all positions is included. At regular intervals the tension of the wire coil should be checked to make certain perfect counterpoise is provided.

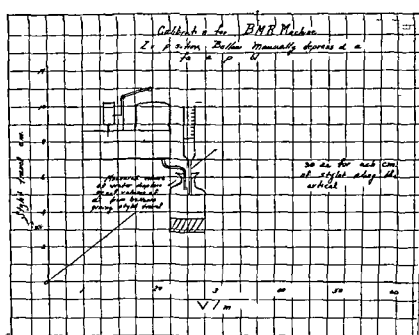


Fig 2 Equipment for plethysmography.

Preparation of the patient A major source of error is the failure to obtain full co-operation and honest effort from the patient. Before introducing the patient into the system the procedure should be explained in detail and the patient allowed to ask questions. Emphasis should be placed on the fact that this is a challenge to personal performance. Accurate results can be obtained only when the patient understands his role, is stimulated to co-operate, and accepts the challenge to sustain the maximum effort to effect the greatest possible gas exchange. The patient is then attached to the system by way of the mouthpiece, a nose clip is secured in place, and he is connected with the spirometer at the end of a normal expiration.

DETERMINATION OF LUNG VOLUME CAPACITIES

Tidal air The patient is permitted resting respirations for approximately four minutes (A to B fig 3). If the pattern of the tracing is extremely irregular in rate and depth of excursions, the patient should be given sufficient time to adjust to the situation until uniformity of the excursions is obtained. If the pattern dem

onstrates a progressive increase in rate and depth of excursions, this indicates that carbon dioxide is accumulating in the system and causing increased respiratory stimulation. The soda lime

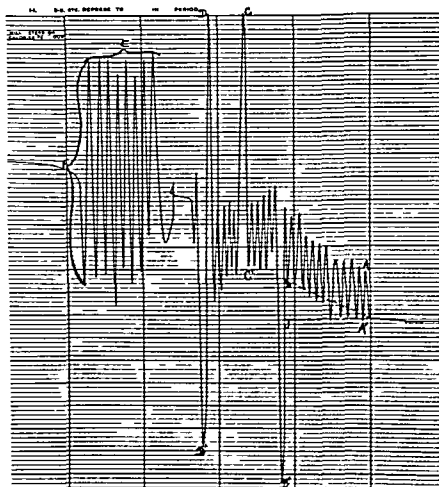


Figure 3 The respiratory tracing

should then be replaced, and its efficiency checked by analyzing the spirometer air for carbon dioxide. If the rise is above 0.2 percent the soda lime should be changed. Most commercial preparations contain color changing indicators. To obtain representative tidal exchange multiple excursions must be measured and a mean determined. Tidal excursion are exceedingly variable during spirometer rebreathing, and only the average of multiple readings is representative of true tidal exchange.

Respiratory rate This is obtained from the respiratory tracing by averaging the excursions per unit of time along the horizontal. If calibrated graph paper is not available, the necessary time calibrations can be made with a stop watch and flash lamp.

Resting breathing requirement (minute volume for basal level of activity) This is obtained by multiplying the tidal exchange by the minute respiratory rate. The resultant is the resting breathing requirement.

the subject at rest or during various grades of exercise. A 20 minute rest period is required in obtaining the minute volume of the resting patient. Corroee reports that the minute volume of respiration is usually stabilized within that time. This value can be obtained either in the closed spirometer system or in the open Douglas bag system. It serves to express the economy of ventilation at graded levels of physical activity and is important in the relationship between tidal volume and respiratory rate. A breathing requirement of 6 liters per minute due to a respiratory rate of 30 per minute with a tidal air of 200 cc and 1 of 6 liters per minute due to a respiratory rate of 10 per minute with a tidal air of 600 cc represent entirely different circumstances in the patient's respiratory economy and effective alveolar ventilation. Assuming a physiologic dead space of 150 cc in each patient the effective alveolar ventilation in the former is 50 cc whereas in the latter it is 450 cc per breath. The ratio of minute volume to oxygen consumption forms an important relationship known as the ventilation equivalent for oxygen.

Oxygen consumption. This is calculated from the slope of the respiratory tracing as represented by the dash line from A to B, figure 3. The vertical distance from B to J is the oxygen consumed in a unit of time. Accurate values for oxygen consumption can be obtained if adequate mixing of the spirometer gases, rapid absorption of the carbon dioxide and a leakproof system are provided. The relationship between oxygen consumption per unit of time to total amount of air ventilated—the ventilation equivalent for oxygen—expresses the efficiency of oxygen absorption. It is of value in comparing the oxygen used in rebreathing room air with 100 percent oxygen. In normal persons the uptake of oxygen remains the same under both conditions; there is no oxygen deficit. In patients whose arterial blood is unsaturated with oxygen an increase of oxygen consumption is noted during the first few minutes of high oxygen breathing. This observation also reported by Courmand and associates²¹ does not replace the findings of specific arterial oxygen studies but it has value as a simple screening measure.

Expiratory reserve. The patient is instructed to make a maximum expiration at the end of a normal inspiration (B to B' fig 3). Caution is given that the preceding inspiration should not be exaggerated. After a few normal breaths this procedure is repeated. This volume is influenced by even a minimal degree of airway obstruction and may show marked variation in daily measurements. The volume is important in determining the size of the residual air compartment. Early in a disease process of an obstructive nature this is usually the first division of the total lung volume involved in producing a state of ventilatory insufficiency.

Inspiratory capacity The patient is told to make a maximum inspiration at the end of a normal expiration (C' to C, fig 3) Caution is given that the preceding expiration should not be exaggerated After a few normal breaths the procedure is repeated

Vital capacity The "component" vital capacity is obtained by adding the expiratory reserve and inspiratory capacity values The "single stroke" vital capacity is obtained by having the patient make a continuous maximum inspiration followed by a maximum expiration (D to D', fig 3) In a future report the significance of the two procedures will be discussed, together with changes occurring in certain disease states associated with pulmonary insufficiency In an obstructive type of insufficiency the expiratory reserve usually is most impaired, while in a restrictive type of insufficiency it is the inspiratory capacity The importance of noting the ratio of the two separate components to the total stroke volume or vital capacity cannot be overemphasized In patients with normal pulmonary function the combined vital capacity and the single stroke vital capacity are usually the same though the former may be slightly greater When the combined vital capacity is smaller, the patient may be making less than his maximum effort In the presence of severe to moderately severe obstructive disease such as asthma and emphysema, the combined vital capacity may be considerably greater than the single stroke vital capacity This finding has also been reported by Cournand and Richards⁵ The vital capacity also decreases progressively and significantly with age Therefore any formula for its prediction must be based on age as well as sex and height.¹⁻²² The regression formula presented by Cournand is the one used in this laboratory for calculating the predicted normal vital capacity For women it is $[21.78 - (0.101 \times \text{age})] \times \text{height in centimeters}$, and for men it is $[27.63 - (0.112 \times \text{age})] \times \text{height in centimeters}$

The timed vital capacity is a dynamic measurement as it relates the total volume of gas displaced from the lungs to the factor of time The amount of gas displaced per unit of time for example one second, two seconds, and three seconds had been advocated by Gaensler²⁻²² The "timed vitalometer," an instrument constructed with the aim of evaluating time relationships in gas displacements from the lungs, was developed by him² His criteria for normal performance of the timed vital capacity are 75 percent of the total stroke volume displaced at the end of the first second 85 percent displaced at the end of the second second and 95 percent displaced at the end of the third second This test detects air outflow obstruction not recorded by conventional vital capacity It correlates well with impairment of the maximum breathing capacity and subjective dyspnea Often the patient with severe pulmonary insufficiency due to obstructive

disease over a prolonged period and by exhausting effort can achieve a normal or greater than normal vital capacity. The test is helpful in estimating disability in obstructive disease and affords insight into the work involved in effecting gas displacement from the lungs.

Maximum breathing capacity This testing procedure can be the most effective measurement of the bellows action of the chest. Cournand and Richards have pointed out that a satisfactory performance is a function of well co-ordinated neuromuscular chest movements, a patent tracheobronchial airway and normal elasticity of all parts of the lung. The paramount requirement in this test is a maximum subjective effort which should be demonstrated for the patient.

The patient is instructed to breathe as rapidly and as deeply as possible for 15 seconds. The use of a stop watch is recommended. The recording drum may be rotated manually during this procedure to prevent the overlay of the individual excursions and to isolate this exercise. The tracing should be watched for evidence of rapid shallow breathing. In our experience it has been best to start the exercise at the completion of a normal expiration (thorax in the resting respiratory level or midpulmonary position). The soda lime canister may be removed from the spirometer to provide respiratory stimulation with carbon dioxide and to diminish mechanical resistance. The regression formula for calculating predicted normal values as expressed by Cournand is applicable to this method of testing. For women it is $[71.3 (0.474 \times \text{age})] \times m^2 \text{ B.S.}$ and for men it is $[86.5 (0.592 \times \text{age})] \times m^2 \text{ B.S.}$ In these formulas $m \text{ B.S.}$ is meters of body surface.

Another simple technic is to use a Douglas bag, a high velocity one way valve and a Benedict Roth type face mask. The gas collected in the Douglas bag is then measured in a Tissot gasometer or a conventional gas meter. The outstanding value of this procedure is the lowered resistance against which the patient must work and the higher performance volumes obtained. The regression formula expressed by Wright² is applicable to this method of testing. Calculated predicted normals by this formula are higher than those obtained from the Cournand formula. However, the relationship of performance value to predicted value for the two methods is very similar in terms of the calculated percent of predicted normal. In our experience the performance value difference between the two methods changes most as the severity of pulmonary insufficiency increases. This is particularly true in obstructive disease. It is our belief that the Douglas bag technic is much more accurate for this group of patients because they are extremely sensitive to the resistance offered in the spirometer. We recommend that in the use of either technic a sufficient number of persons with normal pulmonary functions

be tested in order to obtain representative values for various age groups

Wright² favors a 30 minute test and has found no significant difference in values obtained during the first and second 15 seconds of the test. In all patients there is an appreciable decrease during the second 15 second period, and we prefer to test both normal and diseased patients in the same manner in order to make statistical studies of performance values

An outstanding value of the spirometric method is the permanent tracing of the respiratory pattern. The characteristic shift of the midpulmonary position into a level of maximum inspiration, indicating air trapping and hyperinflation of the lungs, is diagnostic of obstructive emphysema. In our experience this characteristic respiratory pattern is almost always associated with an increased residual air volume.

MECHANICS OF CALCULATIONS

The calculation of gas volumes is taken by direct measurement from the respiratory tracing (fig. 3), and is based on the fact that each centimeter traveling along the vertical by the recording styllet is equal to a known volume of gas. This is the spirometer factor. All ventilatory values must be corrected to body conditions that is, the factors of body temperature surrounding barometric pressure and saturation with water vapor which are commonly abbreviated BTPS. The important consideration in the volume of oxygen absorbed into the blood per minute is the weight or number of molecules of gas absorbed.²⁴ Values must be corrected to the standard conditions of physics and chemistry (760 mm Hg and 0 C) conventionally abbreviated STPD. The spirometer factor for our machine is 207 cc per centimeter. The physical conditions at the time of testing were temperature 26 C, and barometric pressure 755 mm Hg. All measurements were taken from the midpulmonary position as previously defined. The conversion factor for BTPS is 1.068 and for STPD is 0.884. The measurements used are taken from figure 3.

Tidal air A to A is a typical tidal exchange. The average of multiple readings was 2.3 cm. Formula: linear distance (2.3 cm) x spirometer factor (207 cc) x conversion factor for BTPS (1.068) = 507 cc.

Expiratory reserve B to B is a typical maximum expiration. This distance measured 9 cm. Applying the basic formula as given under tidal air we calculate a value of 1,980 cc.

Inspiratory capacity C to C is a typical maximum inspiration. The measured distance was 16 cm giving a calculated value of 3,500 cc.

Component vital capacity Expiratory reserve plus inspiratory maximum gives a value of 5 480 cc D to D represents the single stroke vital capacity

Maximum breathing capacity This determination is enclosed in the brackets E" (number of excursions per 15 seconds) and "F" (amplitude of excursions) The average of 11 excursions was 13 5 cm There are 44 excursions per minute Formula linear distance average (13 5) x spirometer factor (207 cc) x number of excursions per minute (44) x conversion factor for BTPS (1 066) = 120 liters per minute

Breathing requirement (resting minute ventilation or volume) Tidal air (507 cc) x respiratory rate (10 per minute) = 5 07 liters per minute

Breathing reserve Maximum breathing capacity (120 liters per minute) breathing requirement (5 07 liters per minute) = 115 liters per minute This is the reserve breathing capacity for any given physical state

Dyspneic index This is expressed as a ratio

$$\frac{\text{Breathing reserve}}{\text{Maximum breathing capacity}} \times 100 \text{ or } \frac{115}{120} \times 100 = 96\%$$

For the significance and evaluation of this value the article by Cournand and Richards is recommended

Oxygen consumption B to J is the change in volume of gas for this unit of time one minute Formula linear distance (1 5 cm) x spirometer factor (207 cc) x conversion for STPD (0 884) = 262 cc per minute

Ventilation equivalent for oxygen This is the number of liters of air breathed per 100 cc of oxygen consumption As it expresses the total volume of air ventilated per minute per 100 cc of oxygen absorbed the actual oxygen consumption (262 cc) is divided by 100 giving the factor 2 62 cc The total minute volume of air ventilated (6 03 liters) divided by 2 62 equals 2 3 liters This indicates that for every 100 cc of oxygen absorbed 2 3 liters of gas were ventilated Normal values are 2 2 to 2 6 This expresses the efficiency of oxygen absorption relative to the amount of pulmonary ventilation This value is elevated in the presence of pulmonary insufficiency anxiety hyperventilation and hypothyroidism and is usually reduced in the presence of uncomplicated hyperthyroidism

Analysis of the respiratory tracing Important information regarding chest movements elasticity of the lungs obstruction to the movement of air in any phase of respiration resistance of the tissues of the thorax to change in position and state of the pa

tient during the testing procedure can be obtained by careful analysis of the respiratory tracing. Velocity of air flow is represented in the character of the tracing slope. In normal patients there is an almost perpendicular slope, whereas in those with reduced air flow there is reduction of the steepness of the slope. Air leaks in the system can be readily detected in the character of the tracing, manifesting near vertical volume change. Failure of the thorax to return to its resting respiratory level is characteristic of air trapping and hyperinflation of the lung seen in obstructive emphysema. Carbon dioxide retention is demonstrated by progressive increase in rate and depth of breathing. Anxiety and over all poor adjustment to the test is demonstrated by irregular tidal exchange and a sighing type of respiration.

Air velocity index This is the ratio in percentage of predicted normal maximum breathing capacity to predicted normal vital capacity. It aids in differentiating between obstructive and restrictive types of pulmonary insufficiency. When both values are 100 percent the ratio is one, which is normal. When maximum breathing capacity is more impaired than vital capacity, the ratio is less than one, and is suggestive of an obstructive defect. When vital capacity is impaired more than maximum breathing capacity, the ratio is greater than one and is suggestive of a restrictive defect. Gaensler²⁷ developed this concept and advocated its use as an aid in differentiating between obstructive and restrictive types of ventilatory insufficiency. The index may be misinterpreted without the absolute figures from which it is derived. An index of one can result from proportionate reduction in both maximal breathing capacity and vital capacity.¹⁰

SUMMARY

The spirometer is the basic apparatus necessary for carrying out a number of simplified pulmonary function studies. In the absence of a specialized respirometer, a waterless basal metabolic machine can be used. It is recommended that a sufficient number of persons with normal pulmonary functions be tested to obtain representative values for the various age groups characteristic for the particular equipment used and the techniques employed. Information obtained from ventilatory studies in combination with the basic clinical procedures will provide adequate evaluation for most patients with diseases of the chest and with associated pulmonary insufficiency.

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SURVEYS AND SURVEYS

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(Health and Medical)

IN the "Message from the A M A " appearing in this and the last issue of the *Armed Forces Medical Journal*, results from the survey of physicians being released from active military service conducted by the Council on National Emergency Medical Service of the American Medical Association have appeared. On behalf of the editors of this *Journal* I wish to comment on several of the questions.

First, it should be noted that one of the members of the Council on National Emergency Medical Service is also a member of the Health Resources Advisory (Rusk) Committee, another is a consultant to the Committee, and a third was formerly chairman of the Armed Forces Medical Policy Council in the Office of the Secretary of Defense. Furthermore, the Office of the Secretary of Defense is in close rapport with the Rusk Committee and is occasionally represented at its meetings. Therefore, the numbers of medical officers allotted to the Armed Forces, their problems and their duties are under constant discussion not only between these two groups but also with the Office of the Assistant Secretary of Defense for Manpower and with the three Surgeons General. We wonder, therefore, how many of those replying to the questionnaire knew as much about the over all problem of medical needs and requirements of the armed services as the group mentioned above. This is particularly true in any consideration of proper rotation policy, types of assignment, requirements for nonmilitary care and duties that could be performed adequately by other personnel.

Is it wise, for example, to replace medical officers in command and executive officers of medical installations with medical service or line officers? These questions are much debated, and while to some it would appear that such positions could be adequately filled by a nonmedical officer it is far wiser in our opinion that the commanding officer should always be a medical officer and the choice of executive officer should perhaps be optional, though preferably medical. Substitution may well be made for many other duties such as giving infusions, hypodermics, or any medication bandaging, changing dressings, certain

clerical work administration selecting battalion aid clearing station and hospital sites and supervising food and other medical or paramedical functions But do we really want complete substitution which would surely leave the medical officer immured in his ivory tower where the internist merely thinks cogitates and propounds subjects for discussion makes his rounds or consultations and then retires like Achilles to his tent where the surgeon only cuts and cuts and sews while the lady in plaster applies the cast when needed the corpsmen put on the dressings and the surgeons look in but occasionally to advise whether a tube or an infusion is necessary Is this all we desire of our medical officers?

Hence when we come to answer the question as to what duties could have been performed adequately by other personnel there is an enormous chance for difference of opinion and many of these differences are due to the age of and position held by the individual answering this question Even more basically they resolve themselves into what are his motivations in medicine and what does he expect to do in practicing this science and art? Does he want to get out of all the work he can or is he willing and does he really want to pitch in put his shoulder to the wheel and help his group or outfit whether in civilian or military life to be as good as he knows how to make it?

Types of assignment and nonmilitary care provided Much is made of and much talk arises about the care of dependents The Secretary of Defense appointed a commission in April 1953 to study this very problem It was composed entirely of well known lay civilians We quote from the Moulton Commission report

The Commission believes that one of the most important bolsters to morale is the assurance afforded military personnel on the fighting front that the welfare of their dependents is being looked after by the military organization itself Second circumstances often preclude dependents obtaining services through civilian sources This is especially true in the overseas areas where not only must physicians in the armed services care for their own personnel but also military dependents and all Americans of other branches of the federal government who are on duty in those areas For example although the military population may be only 22 000 in a given area when dependents and other American nationals in that area are included the total American population for which the military in that area are responsible exclusive of the men in the service is another 24 000 The same applies in certain parts of the United States due to the fact that it has been considered good policy that the families not be separated but that they accompany the servicemen on their assignments whenever possible At such areas as Key West Fla Camp Pendleton Calif Camp Lejeune N C Fort Bragg N C

Fort Knox, Ky, Larson Air Force Base, Wash, Mountain Home Air Force Base, Idaho, and at other such locations there are simply not enough civilian doctors and dentists to care for the added load of dependents, and in some instances the local medical societies have requested help

Another argument is the more varied practice afforded to all men in the service and added educational and training opportunities offered by the care of dependents. Further, it may be considered a waste of resources both in space and personnel in military medical facilities, when such are available, not to care for dependents. Finally, "the services regard dependent medical care as an important factor in getting and retaining competent career military personnel." This last argument is important today as it was in the past. In order to equalize the care afforded medical dependents, a bill has been introduced into the Congress for this purpose. How great is this load of dependents? The heaviest load is of course in the outpatient services. As regards the beds occupied in February 1954 for example, military dependents occupied 15.3 percent in Continental United States and 13.1 percent overseas, the ranges varying from 7 percent overseas for Navy dependents to 22.3 percent for Air Force dependents in the United States. We think that all will agree that a medical service devoted only to the care of military personnel, the young adult group between 18 and 50, except in time of war provides a very dull medical service.

Another question was asked about physicians who would voluntarily remain in the service. The response to this was most interesting because 2,144 or 57.5 percent answered "yes under certain specified conditions," although none noted any of these conditions. It would be interesting if some of those who answered "yes" would inform this *Journal* the services or the Department of Defense under what conditions they would consider that a military career would prove attractive.

Surveys are not only interesting but helpful, but in interpreting them attention should be paid to the emotions evoked at the time, to the age "of those replying to the questionnaire," and to the knowledge of the respondents as to the requirements—physical, moral, psychological, training, planning, and morale of the military services for medical manpower.

THE BIRTH OF THE ROYAL CANADIAN ARMY MEDICAL CORPS

J P M C A B E L t t C I t C D R C A M C

ON 2 July the Royal Canadian Army Medical Corps commemorates its fiftieth anniversary. On that day in 1904 General Order No 98 announced that henceforth the Canadian Militia Army Medical Services would be known as the *Army Medical Corps*. This was its birth; its gestation began much earlier.

Prior to 1885 Canada was neither wealthy nor populated enough to support a medical service. The British forces garrisoned here supplied most of the manpower and equipment needed to suppress the various uprisings that marked the early history of Canada. The North West Rebellion (Second Riel Rebellion) of 1885 gave the Canadian Militia its first experience independent of British control. In preparation for a military expedition against Riel and his followers, the Minister of Militia and Defence called upon Lt Col Darby Bergin, an eminent physician from Cornwall, Ontario, to come to Ottawa and organize a medical service to support the expedition. He was well qualified. He had served as a major in the Fenian Raid and held the highest medical appointment in Ontario. Dr Thomas G Roddick of Montreal was appointed as his deputy. The appointment had public appeal as Roddick was a man of youth and vigor. He too was well qualified professionally and an excellent horseman. Together they laid their plans. It was not an easy task as they had neither men nor equipment, but they had to their credit a medical profession willing to do its utmost to serve its country.

Two field hospitals were hastily organized—No 1 commanded by Surgeon Major C M Douglas VC, No 2 by Surgeon Major H R Casgrain. Cots, mattresses, sheets, pillows, and similar necessities for field hospitals were not only lacking but were not on the market and had to be made to order. Seven days after Surgeon General Bergin took charge, the full equipment for No 1 Field Hospital was on its way to Winnipeg. A few days later the equipment for No 2 followed; a week later a reserve supply was on hand.

F m D i r t a f M d c a l S r v D p m e t i N t n a l D i f n c A y
O t t a w a C a n a d a

Medical personnel were assembled even more quickly. There was no scarcity of doctors. Men high in the medical profession and with much military experience rallied to the cause. Bergin called for volunteers. Nearly every medical student in Canada came forward, asking only for transport to the field of battle, but the Surgeon-General would not condone such sacrifice, and a rate of pay was established. The Universities of McGill and Toronto selected the most suitable candidates from the numerous volunteers. Dr. Bergin later reported that these students, employed as dressers, without regard for personal safety, did a heroic job of evacuating casualties under fire.

On 1 April 1885, Bergin was called to Ottawa and on the seventh, one week later, Roddick, together with No. 1 Field Hospital under Douglas, left for the west. The party arrived in Winnipeg on the twelfth. He was instructed by General Middleton, Commander of the Force, to establish the hospital at Swift Current, some 500 miles further west. No. 1 Field Hospital's movement from Winnipeg to Swift Current was by rail. The train comprised a railway caboose, a sleeper, and a baggage car. It may be considered the first hospital train to operate in Canada. As neither houses nor tents were available in Swift Current, the train was used to accommodate both surgeons and dressers. A base hospital was established here, but was later moved to Moosejaw. Two field hospitals were set up, one at Calgary and one at Saskatoon.

The first action against the rebels was at Fish Creek. Middleton's Force sustained 50 casualties. In his report the General told how, in a "sort of Zareba" formed by a few wagons almost under rebel fire, the doctors established a temporary hospital where they did their work with skill, coolness, and quickness. The wounded were eventually evacuated to Saskatoon where they were nursed in private homes and in the school building.

In contrast to modern warfare this campaign was not large. Less than 5 000 troops were actively engaged in the field. There were only four engagements with the rebels: Fish Creek, Cut Knife Hill, Batoche, and Loon Lake. Twenty-six men were killed and 103 wounded. Nevertheless, these troops were operating many miles from their base with no mechanized transport. Every morsel of food had to be brought forward in wagons from the base 600 miles away. Surgeon Major Casgrain, the medical officer in charge of No. 2 Field Hospital, in a letter to his brother dated 1 May 1885, reported that "each hospital was equipped in the most thorough style. I doubt very much even in the large cities of Canada whether the hospitals there are better stocked with medicines and surgical appliances."

Surgeon General Bergin had gained much experience and from the lesson learned he was able to make a definite recommendation as to the future of the Canadian military medical service. The old regimental medical service had to be changed. The fact that each regiment recruited its own surgeon was considered the chief weakness in the system and he strongly recommended that this practice be abolished. He then proposed the formation of an administrative and executive staff, a field hospital corps, an ambulance corps, and a military cadet corps. He recognized that if the wide expanse of Canada was to be covered effectively, a transport service was essential.

But the medical services so created died with the emergency that brought it into being. The regimental system of appointing medical officers continued to be the principal medical coverage of the militia except that at the annual military camp a principal medical officer was appointed to supervise the medical services of the camp and to give instructions. There were no centralized directions and without such control little could be accomplished.

The virtual stagnation of 11 years between the Second Riel Rebellion (1885) and 1896 ended with the election of Sir Frederick Borden, a former medical officer, to the position of Minister of Militia and Defence. Shortly after his appointment he established a medical subdepartment of militia under the direction of a director general. The appointment was announced on 1 March 1898 and a resemblance of order now took place. The first director was Col J L H Neilson who held the appointment until 1903. This was probably the first step in the evolution of an Army Medical Service as distinct from a purely regimental medical service.

In the following year, by General Order No. 62, plans were evolved for the organization of the Canadian Militia on an Army basis. Within this framework it was proposed to create, as one of the new departments, the Canadian Militia Medical Army Services. It was visualized that its evolution would be gradual and, as a beginning, four bearer companies with the requisite number of personnel were provided during the years 1899-1900. It was also contemplated that a cadre of four field hospitals would be organized. The Canadian Militia Army Medical Department so formed consisted of two distinct branches, namely (1) Militia Army Medical Staff Service, consisting of the Militia Army Medical Staff and Militia Medical Army Staff Corps, and (2) Regimental Medical Service.

The Militia Medical Army Staff Service was made up of a proportion of principal medical officers who would exercise command and medical supervision in the positions allotted to them. It also comprised the whole of officer and other rank personnel

required for the bearer companies, field hospitals, and medical administration duties. The Militia Army Medical Corps consisted of the noncommissioned officers and privates specially enlisted and allotted to the bearer company and the field hospital.

The only Medical Service in existence prior to this was the Regimental Medical Services, and in order to form the new department the Regimental Medical Officers were invited to volunteer for either the Medical Staff service or Medical Staff Corps. Combatant rank was given to all officers appointed but the officers of the Regimental Service retained such compound titles as surgeon-lieutenant, surgeon captain, and surgeon major. The uniform to be worn was that of the Royal Army Medical Corps (British).

The general order also stressed the need for a base hospital, although the civil hospitals would be used whenever possible. In the event that no civil hospitals were reasonably available, a temporary staff was provided and the Director General was authorized to form a hospital when and where required.

The need for a nursing service was mentioned but it was pointed out that such an organization was planned and would be formed at a future date.

It was during this period of development that Canada was again involved in another uprising. The Boers of South Africa had revolted, and Canada went to the assistance of Great Britain. In 1902 the No. 10 Field Hospital sailed for South Africa and distinguished itself in the field. A second hospital was dispatched later. Sixteen militia nursing sisters saw service in South Africa. Two regimental medical officers were awarded the Distinguished Service Order in this campaign.

At the close of the Boer War the medical service of Canada had gained further experience, and was now prepared to step out as a fully fledged part of the Canadian Militia.

In 1904 the step was made. By Canadian Militia General Order No. 98 of 2 July the Army Medical Service was completely reorganized. Two distinct branches were recognized: (1) the old Regimental Medical Service and (2) the Army Medical Department. The Regimental Service was much the same as before, except that the old compound titles were abolished and the combatant ranks of lieutenant, captain, and major were adopted.

The Army Medical Department was composed of the Medical Staff and the Army Medical Corps. Both were under the same director general. The former might be said to have as its sole function the administration of the Service throughout Canada. It consisted of 12 principal medical officers, one for each dis-

trict. The Army Medical Corps however consisted of two distinct branches one the Permanent Active Militia Army Medical Corps and the other the Militia Army Medical Corps. The permanent element was charged with what one might call the professional aspects of the corps. The Militia Army Medical Corps was what is now known as the Reserve. Besides the Reserve medical officers it was composed of dental surgeons and nursing sisters. The dentists at that time were not permitted combatant rank.

This organization is basically similar to the one that exists today with the exception of the Army Medical Staff and the Regimental Medical Service. The Army Medical Staff was abolished in 1906 and its officers were absorbed into either the Active or Reserve elements of the Medical Corps. The old Regimental Medical Service was abolished in 1909.

There is little point in considering the details of unit or organization prior to 1914 save perhaps to note the development during the years 1905-1906 of a new type of unit the field ambulance. In the initial stages about 16 such units were authorized and they were formed by combining the existing bearer units and the field hospitals. This reorganization brought the Canadian Army Medical Corps into line with that of the British and resulted in a considerable increase in the efficiency of the medical services. At the outbreak of World War I the active element of the Canadian Army Medical Corps had on its permanent establishment 20 officers five nursing sisters and 102 other ranks. The Reserve or nonpermanent element had six cavalry field ambulances 15 field ambulances and two clearing hospitals. The Canadian Militia always tended to pattern itself after the British Army and what was true in general was also particularly true of the Canadian Army Medical Corps especially in its early stages of development prior to 1914. This was fortuitous as the Canadian Medical Service was able to take its place alongside its British allies in France and Flanders during World War I.

This tendency to follow the British was inevitable. The first three directors (Neilson Fiset and Carleton Jones) were all men with considerable experience in British medical practice both military and civil. The formation of the Royal Army Medical Corps was much earlier than that of its Canadian counterpart and provided a model for the development of the Canadian services.

Before the new formed Canadian Army Medical Corps had reached maturity it was called upon to support the Canadian Militia in that heroic struggle into which the Kaiser had plunged the world. In August 1914, Canada had declared war against Germany and the subsequent mobilization and concentra-

tion of troops in Valcartier threw considerable strain on the medical services. More than 83,000 troops were assembled in ill prepared accommodations in Valcartier which had been only recently cleared to billet troops. Sanitation and hospital facilities were minimal but it is a credit to the corps that no serious epidemics developed.



Brigadier K. A. Hunter O.B.E., C.D. the present Director General of Medical Services of the Royal Canadian Army Medical Corps. He was appointed to this position on 11 October 1952.

The tasks of Valcartier were not lessened when the first contingent arrived on Salisbury Plains. It was autumn and one of the worst that England had experienced for many years. Rain and mud, scarcity of supplies and equipment and epidemics were the enemies of the medical services, but by spring the contingent was able to take its place on the battlefield of France.

The first major battle for the Canadians was the Second Battle of Ypres. In April 1915 the enemy put in their now famous attack using poison gas for the first time. Canadian casualties alone were 6,500 killed, wounded, and missing. The field am

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Quebec He received his early training at the Army Medical School, Netley England In 1869 he was appointed Medical Officer to the Quebec Garrison Artillery He saw service during the Fenian Raid, was a Red Cross surgeon in the Russia Turkish War of 1878, accompanied the Canadian "Voyageurs" to the Sudan in 1884 1885 Being a man of independent means he was able to devote much of his time to the Army In 1896, while serving with the Artillery Garrison he was called to Ottawa to become Director General As no office space was available, a railed off section at one end of a corridor formed his first office It was not only his office but, by the addition of a single cupboard, served as his stores depot and contained the complete reserve medical stores of the service

Neilson was Director General during the Boer War He devised a new type of hospital tent which later bore his name He introduced the mobile acetylene gas lamps for use in field hospitals This innovation was first used in the Boer War and was so superior to the old-time lamps that the Canadian Field Hospital in South Africa often became a beacon light to guide troops who had lost their way

Col Neilson had under him another energetic officer, Capt. Eugene Fiset, who took over as Director General in 1903 Fiset introduced the Field Ambulance to the Canadian Medical Services and it was during his tenure of office that the Permanent Army Medical Corps came into being Col Fiset is well noted for the interest and advances he made in camp sanitation. He introduced the "slop sink," a simple contrivance whereby kitchen refuse was placed in boxes with holes bored in the bottom These boxes were placed over slit trenches the principle being that the liquid would drain away so that the residue could be destroyed by burning Camp sanitation in those days was not under medical supervision and any suggestions put forward by the medical officer seldom met with approval and it was often construed as gross interference However, by persistence and example, the medical officer won out Medical units in camp were as a rule, neat and tidy in comparison with other units which considered camp sanitation as an unavoidable evil to be dealt with by conditioning both the nose and the stomach to accept it without revolt It finally took a series of severe epidemics to prove to the Army as a whole the need for camp sanitation.

Col Fiset was greatly assisted in his task when he was appointed to the position of Deputy Minister of Militia which gave him the authority to implement many of his views He was succeeded as Director General of Medical Services by Lt. Col Guy Carleton Jones, a native of Nova Scotia who, after a successful tenure as Director General became Lieutenant Governor

cover in just touching upon the stupendous accomplishments of this great man during his long lifetime of leadership in so many fields related to medicine. In my title I have called him the medical genius of the 19th century for the more I have explored his various contributions to his time the more the conviction has grown that to an extraordinary degree Dr Billings was the source of most of the advances made during that period and since.

In my own experience over the past twenty years as I have traced the history of one phase of modern medicine after another back to its beginnings Billings the Sage of the Army Surgeon General's Office and the Surgeon General's Library is revealed as the original inspiration in an amazing number of instances. The nuggets one picks up in medical sands of time can be traced again and again to the same motherlode. To carry the metaphor one step further one can say that the medical profession of today continues to treasure and use these golden contributions to medical progress but has largely forgotten the source from which they were mined.

Medical and of course other librarians revere his memory and his name and fame are treasured at Johns Hopkins but most medical men including leaders in university circles are surprised to learn of the essential and primary roles Billings played in the creation of what is now the Armed Forces Medical Library the *Index-Catalogue* the *Index Medicus* the Johns Hopkins Hospital and Medical School and the fundamental concepts on which modern pre- and undergraduate medical internship and graduate medical education are now based. His brochure entitled *Medical Education* containing extracts from twenty lectures delivered before the Johns Hopkins University faculty in 1878 set the standard and pattern by which that University ushered in the dramatic advances made by American medical schools and teaching hospitals in the twentieth century. His little pamphlet *Ideals of Medical Education* delivered as an address before the medical faculty of Yale College June 28 1891 has long been forgotten but still makes vivid stimulating and up-to-date reading. At the 25th Anniversary celebration of the opening of the Columbia University Presbyterian Medical Center which occurred about ten days ago and at which there was considerable review of medical progress I learned in conversation with a number of outstanding leaders present that they were unaware of Billings' basic contributions to medical thought and standards of health education from 1870 to the 1890 s—although this culminated in the revolution among medical schools touched off by the Flexner Survey of 1910. Billings clearly visualized the need for both general physicians and specialists and outlined educational criteria essential to qualify each for

their responsibilities. He set up the ideal of a liberal arts college course and two years in the basic sciences as the foundation for clinical studies. At a time when most graduates entered practice after only three years of medical school, he forecast the universal need of an internship year, even though American hospitals at that time could not provide more than one third of the opportunities needed. Not only did he anticipate the necessity of the setting up of accrediting Boards in all of our states, but he realized that this advance would have the undesirable effect of encouraging cramming for those examinations as the ultimate test of competence to practice. For a graduate desiring to specialize, he recommended an additional two years spent "in clinics and laboratories devoted to his special subject—and at least half of this time should, at present, be spent abroad. He was gratified over the announcement in 1891 of compulsory four year courses at the medical schools of Harvard and Pennsylvania, soon to be followed by Columbia.

It is of interest now in 1954 when medical educators are deeply worried over the scarce supply of basic science teachers, particularly in anatomy, microbiology and pathology that Billings asked his audience in 1891, "How many anatomists, or physiologists, or pathologists of the first class, thoroughly trained, authorities in their special fields capable of increasing knowledge and with the peculiar gift of ability to teach—do you suppose are in this country? It is a liberal estimate to say that a dozen of each have thus far given evidence that they exist." It must be remembered that this was said at a time when many more medical schools than now exist were turning out almost as many graduates annually as we are today!

Due to his extremely wide range of acquaintance among the leading medical figures of his day, to his prestige as head of the Surgeon General's Library and Chairman of the Trustees of the Carnegie Institution, and to his numerous writings, Billings was in an ideal position to sound the alarm bell and attract attention to the deplorable state of American medicine, which aroused the profession and the public to action. In a very real sense he was the "Moses" who led us out of the medical "wilderness" and very curiously it was another man of the same surname, Frank Billings of Chicago who served as the "Joshua" to put many of the reforms into effect. It was the latter who organized the Council on Medical Education and Hospitals of the American Medical Association and set in motion the train of events which culminated in the celebrated survey by Abraham Flexner under the sponsorship of the Carnegie Foundation for the changing medical education along the lines of which Billings had been the architect. It was Frank Billings through the movement to set up accrediting boards.

description of a scene in a Civil War Draft Office Still another was a copy of a Salem Oregon paper (undated) summarizing the Gettysburg exploits of Dr Billings and reporting that a Salem citizen Major George Williams had had his leg amputated by him in the famous stone farm house near the base of Round Top where Billings worked as a surgeon Incidentally, Dr Alan Chesney former Dean of Johns Hopkins Medical School who is another Billings devotee and I have a future date to visit that site to complete the set of pictures which should be a part of the Billings record

In the collection of reprints journals and other articles which Dr Billings grandson turned over to me are 126 separate items On checking the list against Garrison's bibliography appended to his Memoir (which totals 171 references) I discovered that the new material contains 41 pieces unknown to Garrison In addition to the priceless speech Ideals of Medical Education already mentioned (which in some way escaped Garrison's attention) there are the following articles which Garrison did not know about or overlooked a letter from Mr Johns Hopkins to his Trustees in 1873 outlining his ideas which guided Billings plans for the New Hospital and Medical School a report on heating and ventilation an address at the dedication of an addition to the Boston Medical Library (1878) a paper on the National Board of Health and National Quarantine in 1880 for the American Medical Association on Public Health and Municipal Government, on the Patent System 1891 speech to Harvard Medical Alumni 1894 another on The World Debt to Modern Sanitary Science (1895) a collection of speeches by DaCosta Cladwick Fletcher Jacobi Osler and Billings at the famous dinner in the latter's honor in 1895 at which his friends gave him a \$10 000 check in an inscribed silver box a 144 page History of Surgery and chapters on Jurisprudence of Hygiene

Among them are descriptions of his part in the development of the Army Medical Museum studies of the effects of high altitude on health of alcoholism typhoid tuberculosis cholera yellow fever and insanity medical topography bacteria and spontaneous generation (1877) medical nomenclature and vital statistics and his letters to a young architect on ventilation and heating For a time in 1884 and 1885 he was interested in composite photography applied to craniology A published lecture on the history of medicine portrayed an interest which led to the foundation of a historical library at Johns Hopkins His *Medical Biography* published in 1883 and an address before the British Medical Association in 1886 on cooperative research are classics and worthy of current interest Many of these articles might be considered for reprinting because of their present as well as historical value If a new biography of Billings is to

be written, it should be based upon a thorough study of his publications for they make a fascinating record all by themselves. All of his writings deserve critical and appreciative review because of their historical and intrinsic value. The new finds and the 171 references listed by Garrison require reappraisal and evaluation to give their author his true place in the advance of medicine.

The whole array of Billings' material illustrates vividly the astonishing breadth and depth of the great doctor's interests. Brilliant as were the creations and contributions for which he should be deservedly famous—in addition to those already mentioned his survey of the Marine Hospital system, which grew into the Public Health Service, the vital statistics of the United States Census (which resulted in the creation of biostatistics as a science in this country), the planning and construction of Johns Hopkins Hospital and Medical School and the assembling of its first staff, the institution of the first public health laboratory at the University of Pennsylvania and finally the organization and erection of the New York Public Library—none of these in Dr. Billings' mind were ends in themselves, but merely to the ends to which he had set himself while still a medical student at the Medical College of Ohio: better care of the patient and better public health generally. As you will recall, the preparation of his graduation thesis on the surgical treatment of epilepsy in 1861 (number 1 in his bibliography) and his frustrations at that time in trying to review the literature ultimately stimulated him to build the Library of the Surgeon General's Office to its outstanding stature. The medical school course of his day with its two sessions of five months of identical lectures in each year, left him with a lifelong determination to put medical education on a better basis. He had had the advantage of a good preparatory college education and as "a young man of very superior talents and extensive acquirements" (as described by his Greek professor) he must have felt keenly the gap between what was and what should be. The years in the Civil War with the horrible infections and stench in the Army hospitals stimulated his immense intellectual powers to solve the problems of isolation, antiseptics, heating and ventilation, and eventually made him the leading hospital and health expert of his day. Thus is genius moulded by the experiences and impressions of the formative and plastic years which led into hard determination and results in persistent and great accomplishment.

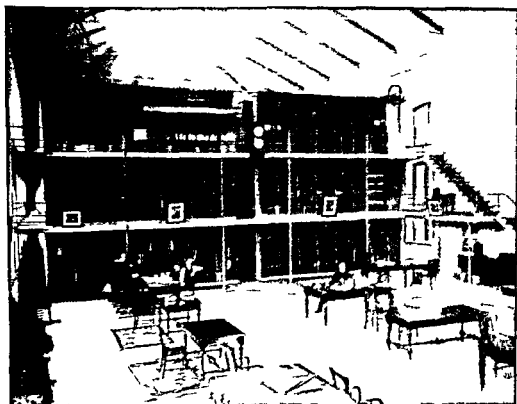
Perhaps his most amazing ability was his capacity for almost incredible coverage of a wide range of literature, for when he was still a college student in 1858 and continued up to his death in 1913. In a delightful address given at the 1913 meeting of the

cover in just touching upon the stupendous accomplishments of this great man during his long lifetime of leadership in various fields related to medicine. In my title I have called him the medical genius of the 19th century for the more I have read of his various contributions to his time the more I have grown convinced that to an extraordinary degree Dr Billings was the source of most of the advances made during the century since.

In my own experience over the past twenty years I have traced the history of one phase of modern medicine back to its beginnings. Billings the Sage of the General's Office and the Surgeon General's Library as the original inspiration in an amazing number of medical nuggets one picks up in medical sands of the past. Traced again and again to the same motherlode metaphor one step further one can say that the profession of today continues to treasure and use these contributions to medical progress but has largely forgotten from which they were mined.

Medical and of course other librarians revere his name and fame are treasured at Johns Hopkins. Medical men including leaders in university circles are surprised to learn of the essential and primary roles Billings played in the creation of what is now the Armed Forces Medical Library. The *Index-Catalogue* the *Index Medicus* the Johns Hopkins Hospital and Medical School and the fundamental principles which modern pre- and undergraduate medical and postgraduate medical education are now based. His book titled *Medical Education* containing extracts of his lectures delivered before the Johns Hopkins University in 1878 set the standard and pattern by which the profession has ushered in the dramatic advances made by American medical schools and teaching hospitals in the twentieth century. His little pamphlet *Ideals of Medical Education* delivered in 1878 before the medical faculty of Yale College. It has long been forgotten but still makes vivid and up-to-date reading. At the 25th Anniversary celebration of the opening of the Columbia University Presbyterian Hospital which occurred about ten days ago and at the same time a considerable review of medical progress I had a conversation with a number of outstanding leaders present. They were unaware of Billings' basic contributions to medicine and standards of health education from 1870 to the present. Though this culminated in the revolution among medical men touched off by the Flexner Survey of 1910. Billings visualized the need for both general physicians and specialists and outlined educational criteria essential to quality

outmoded and unmodernized buildings. In comparison he would be astonished to observe the dramatic advances made in the construction of the magnificent new National Naval Medical Center, the National Institutes of Health, and the New Armed Forces Institute of Pathology at the Walter Reed Army Medical Center. He would be puzzled over the public's apathy in carrying forward similar advances for the projects to which he devoted so much of his creative genius. Certainly he would be disap-



Billings was Librarian of the Army Medical Library from 1868 to 1893. This photograph shows him left in the reading room in 1870.

pointed over the slow progress of the plans for the new Armed Forces Medical Library and at the difficult time the *Quarterly Cumulative Index Medicus* has been having. He might wonder whether we are losing interest in our literary and cultural heritage.

He would doubtless be deeply gratified in the tremendous advancement of the medical schools and centers in the United States in teaching, research, and in architecture following his initial lead, but he would have a hard time comprehending how the tide of graduate students which used to flow to Europe has been almost completely reversed, its flood now sweeping to our own shores. The extent to which the science of biostatistics has come to its own and been made mechanically useful by equipment such as the I B M machines (for which he had

the original ideas) would thrill him enormously. How fascinated he would be in such new developments as air conditioning, fluorescent lighting, radio colored television, and radio-isotopes. He would be astonished to observe how far we have gone in changing the whole face of preventive medicine and epidemiology in this country by the virtual conquest of infectious diseases through the employment of chemical therapeutics and antibiotics, and would shudder with us over the incalculable implications of atomic warfare. How his heart would be warmed by a gathering such as this one of Friends of the Armed Forces Medical Library!

Yet underlying all of the satisfactions and disappointments which he would feel in our successes and failures, Dr Billings' prophetic mind and heart would be reaching deeply into what are the ultimate realities. For so practical a man he was capable of profound mystical speculations, as revealed in the closing lines of his speech before the Philosophical Society of Washington on December 4, 1886, which I would like to quote in part in my conclusion:

Far-reaching as the speculations of the man of science may be, ranging from the constitution and nature of a universal protyle through the building of a universe to its resolution again into primal matter or modes of motion, he can frame no hypothesis which shall explain consciousness; no, has he any data for a formula which shall tell what becomes of the individual when he disappears in the all surrounding mist. Does he go on seeking and learning in other ways or other worlds? The great mass of mankind think that they have some information bearing on these questions, but if so, it is a part of the wisdom of the Orient, and not of the physical or natural science of the Occident. Whether after death there shall come increase of knowledge with increase of desires and of means of satisfying them, or whether there shall be freedom from all desire and an end of coming and going, we do not know; nor is there any reason to suppose that it is a part of the plan of the universe that we should know. We do know that the great majority of men think that there are such things as right and duty—God and a future life—and that to each man there comes the opportunity of doing something which he and others recognize to be his duty. The scientific explanation of a part of the process by which this has been brought about is by natural selection, heredity, education, and progress; these changes in this or that particular mass of biotic matter has not much bearing on the practical question of "What to do about it?"

Speaking to a body of scientific men, each of whom has I hope also certain unsentimental beliefs, desires, hopes, and longings, I will only say: Be strong and of a good courage. As scientific men, let us try to increase and diffuse knowledge; as men and citizens, let us try to be useful; and in each capacity, let us do the work that comes to us honestly and thoroughly, and fear not the unknown future.

When we examine that wonderful series of wave marks which we call the spectrum we find as we go downwards that the vibrations become slower the dark bands wider, until at last we reach a point where there seems to be no more movement the blackness is continuous the ray seems dead Yet within this year Langley has found that a very long



As a septuagenarian, Billings actively directed the organization of the
 Yoak Public Library where he spent the last 17 years of his life as
 its superintendent in-chief. This photograph was made about five years
 before his death on 11 March 1913.

way lower down the pulsations again appear and for another spectrum they never really ceased but rhythm requiring new apparatus or new senses to And it may well be that our human life is only a tremor and that beyond and above the broad black death there are other modes of impulses—another registers the ceaseless beats of waves from the heart of force the heart of the universe in modes of experience can but dimly dream

John Shaw Billings does live on in our midst I believe and finds immortality in the advance of projects to which he devoted his creative energies and talents and to which we the living may in turn make our contributions

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MILITARY OPHTHALMOLOGISTS AND OTOLARYNGOLOGISTS

PLAN JOINT DINNER MEETING IN NEW YORK 21 SEPTEMBER

The Society of Military Ophthalmologists and the Society of Military Otolaryngologists will hold a joint dinner meeting at the Shelton Hotel in New York City on 21 September 1954 in conjunction with the Seventeenth International Congress of Ophthalmology and the annual meeting of the American Academy of Ophthalmology and Otolaryngology

Members of the two societies and all ophthalmologist and otolaryngologists on active duty with the armed services are invited. Reservations should be sent to Colonel J H King Jr MC USA Secretary Treasurer Society of Military Ophthalmologists Walter Reed Army Hospital Washington 12 D C

Arteriovenous Fistula of the Lung Treated by Segmental Resection

RALPH P. CAMPANALE, Lieutenant Colonel, USAF

LEONARD R. ROBBINS, Captain, USAF

ARCHIE A. HOFFMAN, Lieutenant Colonel, USAF

ROBERT R. SHAW, Major

AN increasing number of cases of pulmonary arteriovenous fistula are being recognized and reported. The use of routine chest roentgenography and the increased alertness on the part of the medical profession have resulted in the fact that surgical intervention is being advised and performed with increasing frequency, and the method which accomplishes the cure while conserving as much normal lung tissue as possible has become the cause of the frequent occurrence of multiple resections. The most ideal

The clinical features of arteriovenous fistula of the lung were excellently reviewed by Yater and associates¹ and more recently by Worth² who emphasized the methods of surgical treatment of the reported cases. They described a unique type of arteriovenous aneurysmal sac through which the afferent vein were carefully excised without disturbing the surrounding tissue. They collected a total of 78 cases. 51 (65 percent) of these patients were treated by segmental resection. The mortality rate of 5.9 percent. Unilateral resection was performed in 46 patients (lobectomy in 26, pneumonectomy in seven, lingulectomy in one, pulmonary artery ligation in one, division of an aberrant systemic artery in one, and division of an aberrant pulmonary artery in one). Bilateral operation was performed in 11 cases (excisions of the lung in one, lobectomy in one, segmental lobectomy in one, three lobectomies in one, and wedge excision in one and lobectomy in one case). Twenty-five of the 78 cases reviewed had multiple fistulae. Yater and associates¹ reported two additional cases. To the best of our knowledge the

bilateral cases reported by Parker and Stallworth together with the case reported by Glenn, Harrison and Steinberg and another by Blades represent the only other reported instances of the segmental method of surgical treatment of this disease entity

In the case reported in this article the patient had multiple arteriovenous fistulas the largest of which was treated by excision of the anatomical segment bearing the lesion

CASE REPORT

A 21 year-old married white woman was first seen on 25 July 1952 in the outpatient department of this hospital for a re check roentgenogram because of a spot on the lung Her characteristic history and physical findings, confirmed by fluoroscopic and roentgenographic findings prompted the outpatient physician to make a presumptive diagnosis of arteriovenous fistula of the lung and to admit her to the hospital for further evaluation and treatment

Past history The patient had been told by her mother that blueness of the lips and fingernails and clubbed fingers had existed since infancy Easy fatigability breathlessness and throbbing of the heart were evident early in childhood to such a degree that a school physician believed the patient to have heart disease and recommended complete avoidance of physical exertion Since her menarche, the patient had experienced frequent, severe throbbing headaches preceded by dark spots in her vision and followed by numbness of the tongue mouth face and ear of the side opposite to the headache These headaches lasted from a few hours to several days and had not responded to ordinary analgesics Since the age of twelve she had had numerous nosebleeds

In July 1950 a routine survey roentgenogram of the chest revealed an abnormality in the patient's left lung field Subsequent study included tuberculin test serial roentgenographic examinations and bacteriologic study of sputum and gastric washings She was hospitalized in a sanatorium where additional studies failed to make a definitive diagnosis Pneumothorax was not done but streptomycin and para aminosalicylic acid were administered for five months during 1951 Additional periodic roentgenograms did not reveal a change in her lesion and in January 1952 she refused exploratory thoracotomy She had been unable to work because of weakness fatigability, and breathlessness She complained specifically of inability to endure one dance climb one flight of stairs or walk one block without moderately severe breathlessness

Physical examination The patient was a well developed and well nourished young woman with moderate cyanosis, most evident in the lips and fingernails, and moderate clubbing of the fingers and toes. Her weight was 115 pounds, temperature 98.4° F, pulse, 78 per minute, respirations, 20 per minute and blood pressure, 112/68 mm Hg. Chest expansion, resonance, breath sounds, and fremitus were normal. A grade III systolic bruit was present over the left axilla and the left apex posteriorly. The heart was normal except for a grade I apical systolic murmur. Several small cutaneous telangiectases were present on her back.

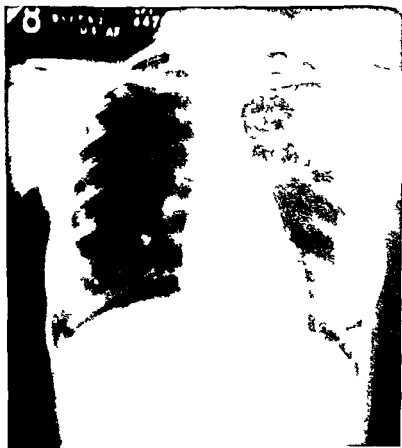


Figure 1. Posteroanterior view of the chest.

Laboratory and roentgenographic findings Erythrocyte and leukocyte counts, hemoglobin, urinalysis, serologic tests for syphilis, sedimentation rate, blood urea nitrogen, fasting blood sugar, blood culture, serum proteins, electrocardiogram, ballistocardiogram, and vital capacity were within normal limits. A phonocardiogram made over the left suprascapular area revealed a continuous murmur with systolic accentuation. The arm to lung (ether) circulation time was 4 seconds.

Poentgenograms of the chest revealed an irregular opaque shadow of homogeneous density measuring about 3 by 4 by 3 cm in the posterior apical segment of the left upper lobe there were two prominent bandlike linear shadows passing from the mass to the left hilus which were interpreted as being vascular chan-

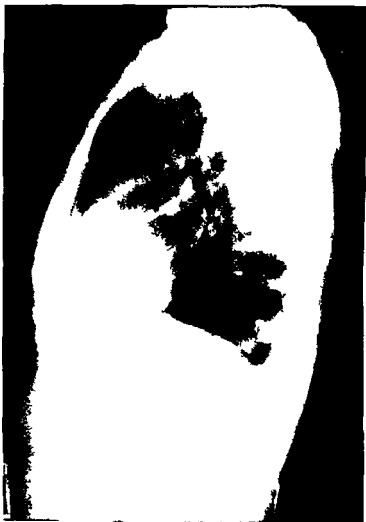


Fig. 2. Postero-lateral view of the left lung field.

nels. On the right side were several similar linear shadows passing into the right apex paravertebrally (figs 1 and 2). Fluoroscopy revealed definite pulsation of the mass in the left apex synchronous with the heart beat. A typical response to the Valsalva and Mueller tests was noted. Roentgenograms of the skull showed no abnormalities.

Angiocardiography was attempted, but was unsuccessful. Because of a marked nitritoid reaction to the 70 percent diodrast which was injected, it was considered unwise to repeat the procedure.

Preoperative course After the diagnosis of arteriovenous fistula of the left upper lobe was established, the patient was discharged from the hospital on 8 August 1952, and readmitted on 18 November 1952 when the physical examination and repeated laboratory tests were unchanged. A similar lesion in the right upper lobe was strongly suspected.



Fig. 3 Photograph of the posterior segment of the left upper lobe with a anomalous veins

Operation On 19 November 1952, under endotracheal anesthesia, a left posterolateral thoracotomy was performed through the fifth intercostal space. A pulsating thin walled bluish-brown mass, about 4 cm in diameter, in the posterior segment of the upper lobe, presented on both posterior and lateral aspects. It was easily compressed between the fingers, and on palpation of the mass gave a distinct thrill. The distal portion of the lingula presented a patchy appearance from smaller masses of similar nature. A third such area, about 1.5 cm in diameter, was visible on the anterior surface of the superior segment of the left lower lobe.

Dissection was begun over the left pulmonary artery, and the branches to the apical and posterior segments were identified. The branch to the posterior segment was triply ligated and divided between the distal ligatures. Dissection in the interlobar fissure revealed an anomalous vein about 1 cm in diameter which passed into the mass. This was similarly ligated and

divided Segmental excision of the posterior segment was then performed and additional large thin walled veins were identified ligated and divided These veins were observed to connect the fistula and hilus

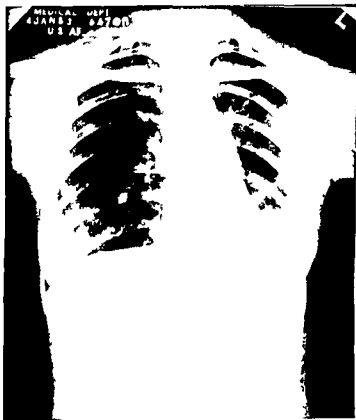


Fig 4 P top II antigen gram.

The distal portion of the lingula was removed by wedge excision and the lesion in the superior segment of the lower lobe was obliterated by several interrupted mattress sutures The left lung was completely expanded and the thoracotomy wound closed in layers with interrupted cotton sutures, after inserting intercostal catheters in the second interspace anteriorly in the mid clavicular line and the eighth interspace in the mid axillary line Upon completion of the operative procedure, the patient's general condition and color were excellent

Pathology report The specimen (fig 3) from the upper lobe was 4 by 3 by 0.9 cm in size pale and crepitant showing several cystic areas on section Histologic examination revealed collections of dilated vessels lined by endothelium and filled with blood together with atelectatic lung parenchyma showing

moderate fibrosis. The specimen from the lingula was 2 by 2 by 1 cm and exhibited the same histologic appearance.

Postoperative course Recovery from the operation was entirely uneventful. The patient received parenteral penicillin and streptomycin for one week, and the wound healed per primum. The bruit over the left side of the chest was absent postoperatively, and the color of her lips and nails was normal. The patient was discharged, completely asymptomatic, on her fifteenth postoperative day (fig. 4).

Follow up The patient was seen at regular intervals in the outpatient department for one year following her operation. She reported that she was able to walk three times as far as ever before without dyspnea, dance five dances, or climb two flights of stairs without distress. Her headaches diminished in frequency and severity. The bruit over the chest did not recur. Clubbing of the fingers diminished and cyanosis disappeared. Roentgenograms revealed the continued presence of the shadows on the right, but an entirely clear left lung field.

Three months postoperatively she became pregnant although she had complained of sterility for almost five years of marriage. Her prenatal period was uncomplicated although slight cyanosis became apparent during the last two months of gestation. Delivery was uneventful and a normal male infant was born on 25 September 1953.

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DIAGNOSIS OF CANCER OF THE LUNG

The principal deterrent in the diagnosis of lung cancer is failure to appreciate the alarming frequency of this disease. Any pulmonary lesion particularly in males over 40 should be considered lung cancer until proved otherwise. This is a realistic and factual conception.

—BRIAN B. HADIS, M.D.
in *Pediatrics Medical Journal*
p. 25, J. 1954

Arteriomesenteric Obstruction of the Duodenum

FERDINAND V BERLEY *Commande (MC) USN*

ROBERT B BROWN *Cpta (MC) USN*

ARTERIOSESENTERIC obstruction of the duodenum is not the popular subject of medical writing that it was 20 to 30 years ago. Only seven case reports have been found in a review of the American literature for the past 10 years while well over 100 cases were reported between 1920 and 1930. This marked discrepancy causes one to wonder whether we are failing to recognize this condition today or whether it was highly over diagnosed in the past.

As the name arteriomesenteric obstruction implies the duodenum is obstructed at the point where it passes beneath the superior mesenteric artery. Von Rokitsansky¹⁷ is credited with the first published description of the entity. Bockus listed nine different theories which have been advanced to explain the mechanism of such obstruction. A discussion of these is not within the scope of this presentation.

The diagnosis of arteriomesenteric obstruction of the duodenum is difficult if not impossible to establish on the basis of the clinical picture alone. The patient is apt to be of the asthenic lordotic type, this habitus accentuated by weight loss. Intermittent upper abdominal pain, cramplike in character, is the usual chief complaint. Often this is associated with nausea and vomiting. Eating particularly large meals will bring on the symptoms and vomiting or lying down may relieve them. A barium study of the upper gastrointestinal tract will demonstrate the site of obstruction with the proximal dilatation of the duodenum. This is particularly true if the roentgenographic examination is made at a time when the patient is having symptoms.

A medical regimen may be successful in the treatment of arteriomesenteric obstruction. Small but frequent feedings are recommended. The patient is instructed to lie in a head down position after eating. If a long intestinal tube can be passed into the upper jejunum, it may be used in severely depleted patients for the introduction of feedings into the intestinal tract below the obstruction.

If the patient does not improve on medical treatment, then surgical relief of the obstruction by duodenojejunostomy is indicated. This procedure was suggested by Bloodgood¹¹ in 1907, and a patient successfully treated by this method was reported by Staveland¹² in the following year. The two patients presented here illustrate the salient points in diagnosis and treatment of arterio-mesenteric obstruction of the duodenum.

CASE REPORTS

Case 1 A 29-year old man was admitted to this hospital on 25 June 1952, complaining of intermittent abdominal pain, nausea and vomiting of 30 days' duration. The abdominal pain was located in the epigastrium and left upper quadrant, with radiation



Fig. 1 (case 1) The duodenum filled to the point of obstruction.

to the left costovertebral angle. The patient gave a history of recurrent attacks of similar pain during the preceding 10 years, with 12 hospitalizations. During this same period he had six to seven bouts of hematemesis, one in 1947 resulting in hospitalization and transfusion. He had been told, on several occasions, that he was suffering from "ulcers" and had refused surgery.

The physical examination at the time of admission showed a poorly nourished man appearing at least 10 years older than his chronological age. The abdomen was moderately tender in the

epigastrium and left upper quadrant with rebound tenderness and slight voluntary muscle spasm. The bowel sounds were normal. There was also left costovertebral angle tenderness.

For several days after admission the patient vomited small amounts (150 to 200 cc) of blood streaked gastrointestinal content. He continued to complain of severe epigastric and left upper quadrant pain. The pain was not constant but recurred frequently.



Fig. 2 (1) R ntigenogr m tak after som bar m had bee pusd distro ghtb p nt fob truction.

The initial treatment consisted of a Sippy diet, 0.4 mg of atropine sulfate and 120 mg of phenobarbital (luminal) every four hours. Because this was not helpful, two days later a Levine tube was placed in the stomach and connected to a Wangensteen suction apparatus. Fluids were administered parenterally and sedatives were given for pain.

On 7 July, although still complaining of pain, the patient had improved sufficiently to tolerate an upper gastrointestinal roent-

genographic examination. The esophagus and stomach were normal. A dilated but otherwise normal appearing duodenum filled well up to a point of obstruction at the site of crossing of the superior mesenteric vessels (fig 1). There was considerable delay at this point, but the examiner was able to push some barium through (fig. 2). After one hour, the barium which had passed through the obstruction demonstrated a peculiar configuration of the jejunum and first portion of the ileum (fig 3). These loops were bunched in the center of the abdomen as though contained in a bag. Although obstruction of the duodenum at the point of



Figure 3 (case 1) Roentgenogram taken one hour after the barium had passed through the obstruction.

crossing of the superior mesenteric vessels had been demonstrated, these additional findings on roentgenographic examination were suggestive of paraduodenal hernia.

On 11 July, a laparotomy was performed under *peritoneal* anesthesia. There was no evidence of old or recurrent ulceration of the stomach or duodenum. The duodenum was found to be dilated about three to four times the normal diameter. This dilatation was seen to end abruptly at the point where the superior mesenteric artery crossed the bowel. Beyond this, the jejunum and ileum were perfectly normal in size. No paraduodenal hernia was present; however, the mesentery of the upper small bowel was

abnormally short. This latter finding probably accounted for the bunching of the upper intestinal loops in the midline as demonstrated in figure 3. A duodenojejunostomy was performed.

Recovery was uneventful and the patient was able to eat normally without pain or nausea at the time of discharge from the hospital on 28 July 1952. Repeated attempts to locate this patient for follow up studies have been unsuccessful.



Figure 4 (case 2) The distorted duodenal loop with the pseudodiverticulum and widening of the celiac duct.

Case 2. A 44-year-old woman was admitted to this hospital on 14 June 1953 with a 13-year history of recurring attacks (four to five times a year) of upper abdominal pain. This pain occurred after meals and was relieved by the passage of time or by vomiting. In addition to pain the patient complained of almost continuous nausea after meals especially if a normal amount of food was taken. As a result of the second complaint she had limited her intake to small amounts of liquids and soft foods.

A diagnosis of duodenal ulcer had been suggested by a barium study of the gastrointestinal tract in 1950. At the same time a barium enema and cholecystogram were negative. The patient had been placed on an ulcer regimen with but partial relief of her symptoms.

By early 1953 a series of gastrointestinal barium examinations had repeatedly demonstrated a badly distorted duodenal cap with two pseudodiverticula, and a widening of the second and third portions of the duodenum with to and fro peristalsis (fig 4) In the erect position, marked visceroptosis was noted and the barium appeared to hang in the widened duodenum (fig 5) Despite active

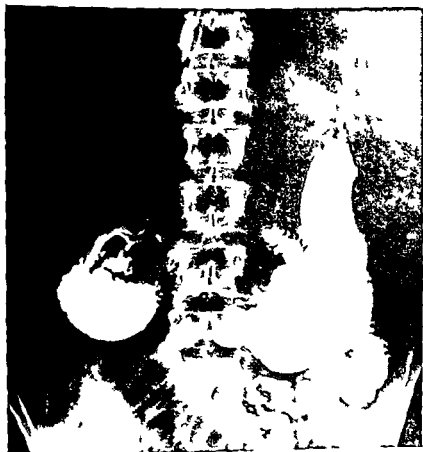


Figure 5 (case 2) Roentgenogram taken in the erect position. The barium appears to hang in the widened duodenum

peristalsis, it failed to pass a point of obstruction where the superior mesenteric vessels cross over the bowel. The obstruction was relieved, however, when the patient became supine.

The physical examination at the time of admission was essentially negative except for obvious undernourishment. The patient weighed 93 pounds, 20 pounds under her normal weight.

On 18 June a laparotomy was performed. The duodenal cap was scarred and two small false duodenal diverticula were demonstrated. There was no evidence of acute ulceration or inflammation. The duodenum distal to the cap was markedly dilated. In its empty state it appeared to be about twice the size of the transverse colon. Further examination showed that this dilatation ended

limits its use to intubation of adult patients of the wide mouthed types. This has been disadvantageous for medical officers in smaller hospitals in giving general anesthesia to children.

We modified this laryngoscope by grinding down the tubular portion of the blade along the line shown in figure 1A. The grinding is carried close to but does not include the wire leading to the bulb at the tip of the blade. The ground edge is given a smooth finish to eliminate rough edges which might traumatize the pharynx or larynx.

The finished product (fig. 1B) is a laryngoscope with a blade which has retained its cylindrical design sufficiently to remain strong at points of stress. The tubular design at the proximal end of the blade has been eliminated and the instrument can be used in adult patients with small oral cavities and in most children even those as young as age three or four years.

The only instance in our experience in which this modified blade was unsatisfactory was in the attempted intubation of a 270 pound man. During the procedure the blade bent near the proximal end. Otherwise this modified scope has been highly satisfactory for use in laryngeal visualization prior to intubation.

R S V P

It has been said that effective psychotherapy for the mild anxiety states can be summed up by the letters R S V P. R stands for reassurance. S stands for suggestion which includes everything from verbal suggestion to hypnosis as well as the occasional use of mechanical devices such as high frequency currents, massage and relaxing exercises. V stands for ventilation. It is extremely important to allow the patient to talk his troubles out. This requires patient listening by the doctor. P stands for persuasion. The patient must be persuaded to persevere in his efforts to get well, to cooperate with his physician, to attend to his physical as well as to his mental hygiene, not to rely too much upon pills and potions, and to participate in activities of which he formerly was fond.

—GORDON R. KAMMAN, M.D.

Journal of the American Medical Association

June 6, 1954

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 J ph I ra l ff 1 t Lt MSC, USA J mes A. Seitz 1 t Lt. MSC USA
 Cl r nc E J h on Lt Col MC, USA J ck C. Shr der Lt Col USAF (MC)
 Thaddeus F Kryshak 2d Lt MSC USA Lawr ce Soy d t Capt MSC, USA
 Ge rg S La nson, May MSC, USA William L. Str ket Capt. MC USA
 William C. Marr tt May USAF (MC) Rob rt B T t t Capt MC, USA
 Ar hubald G M Mart n, III May. USAF (MC) W lson G Thybe g 1st Lt. MC, USA
 Jam s R McL ughlin, Jr Capt MC, USA Harry E W bb Capt USAF (MSC)
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O k L f Cl t r

Th m s f ffc f th m d al s r who h e b e ward d d c r t o s by
 the U t d St t Army N vy or Air Force t p b l i h e d t h i s d e p t m e t h m o n t h
 f l l w a g r l p t o f i n f o r m t i f r m f f c l s u r —Editor

REGULAR MEDICAL CORPS OFFICERS CERTIFIED BY SPECIALTY BOARDS

The American Board of Pathology

A total of 73 regular Medical Corps officers of the Army Navy and Air Force are currently certified by the American Board of Pathology according to information received from the Surgeons General of the respective military departments Activated in 1936 this specialty board on 30 June 1953 had issued certificates to 2 494 physicians Those in the armed services are

R I nd S Ar Lt Col USA

Th od R Aus n, Capt USN

Will m W Ayr Comdr USN

Milward W B yl Col USA

Abram S B Lt Col USA

R b rt E B Maj USA

B yd K Bl k Lt Comdr USN

Alfred S Bl w Lt Col USA

J M Blumb g Col USA

Cha l Boo tr Lt USN

A dr w F Br ff Comd USN

Cha l G B t nah Lt Comdr USN

Cha l E Buck, Capt. USA

Will m C. B tz Lt Col USA

R b rt L Ca gh, Lt Col USA

F is E Counc l Col USA

Elbert D Cour y Br g Gen. USA

H ary R D la y Lt. USN

K ne h F E ns Col USA

Cha l J F na Col USA

Le er W F Lt Comdr USN

R g H. Full Comdr USN

Hugh R Gilmor J Col. USA

J mes B H y N ; USA

J me W Hayn M ; USAF

H gh B H fl Lt. Col USA

R bert L Hull ghor Col USA

N l S Ir y Lt. Col USA

Edmund R K lma Lt. Col USA

R bert J Kl nh Lt. USN

Dw gh M. Kuh C L USA

J hn D L g n, C md USN

R ym nd J L fl Lt USN

P ul C. L Gol Lt Col. USA

Ca l J L d J Col USA

William F Ma Gull vr y Capt USA

Fra k A M J Lt C l USA

V E Ma ns Comdr USN

J h W M o Capt. USA

G org J M C l USA

Rus ll M. M y d Comd USN

Ge g E Me dor Comdr USN

Will m A M w th Capt. USA

Hugh V O Co ll Comd USN

Vern D P Lt Col USA

W lm F P Comdr USN

Thoma F Puck J M ; USA

Al R fr ry Lt Comdr USN

R bert F R ns n, Capt. USA

Albert M Rachm nd Col. USA

J hn S Shave Comd USN

Mar F Sh ll Lt Comdr USN

Ha ld E Shuey Lt Col. USA

William M Sil pha Capt. USN

Bruce H Sm b, Lt Comdr USN

H lm h Sp nz Lt Col USA

G lbe B Stans ll Lt. Col USA

Arthur Ste Lt. C L USA

Carl F T me Lt Col USA

LeGr nd H Th ma Capt. USA

Ralph M Th p Col USAF

Will m D T g rt Lt Col USA

F k M T w d Lt Col USAF

J h L T ll Comdr USN

This l h th f The m f ff f d by b Ame i B d
f An ath l gy w ll be p blish d th A gus

James A. Turner Comdr USN

William L. Wilberk, Capt. USN

Howard A. VanAuk Col. USA

Richard B. Williams Comdr USN

Colin F. VanderBuegg Lt Col USA

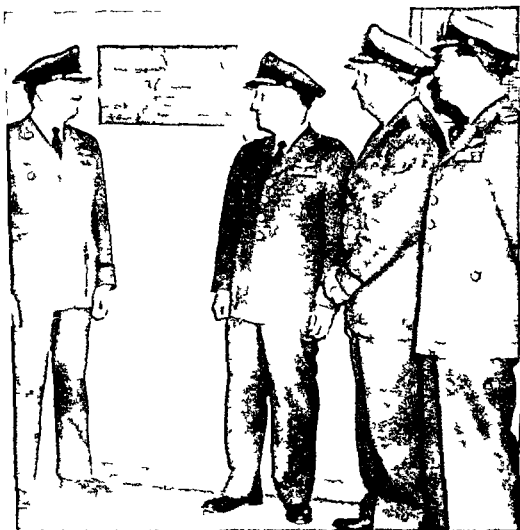
Herbert Wilkin, Jr Comdr USN

Russell H. Walker Capt. USN

L. Enz E. Zimmerman Lt Col USA

Cal J. Weger May USA

AIR FORCE HONORS FIRST SURGEON GENERAL



A new barracks for medical airmen at the U S Air Force Hospital Wiesbaden, Germany was named General Grou Hall in honor of the first Surgeon General of the Air Force Maj Gen. Malcolm C. Grou USAF (ret.), at dedication ceremonies on 14 May 1954. Shown in the new building before a bronze plaque which was unveiled by Maj Gen. Mark E. Bradley USAF Deputy Commander-in-Chief U S Air Forces in Europe are from left to right Maj Gen. Harry G. Armstrong, USAF (MC) Surgeon General of the Air Force Gen. Bradley Maj Gen. Dan C. Ogle USAF (MC) Surgeon, USAFE and Col. Harold F. Fusch USAF (MC) hospital commander Gen. Ogle has been designated to succeed Gen. Armstrong as Surgeon General.

CORRESPONDENCE

To the Editor —I have just been looking over the May issue of the *Journal* and congratulate you on the format and general appearance but particularly on the contents. It is a first class production well worthy of the establishments that it represents.

JOSEPH GARLAND M D

Ed t Tb N w E gl d J urn l / M d
B sto M

TRAINING IN THE SEVENTH ARMY

(The following letter was written to Brig Gen W L Wilson Surgeon Seventh Army by a medical officer who was a long time in Germany. —Editor)

Dear Sir —A civilian physician's experiences in our present cold war Army I'm sure could cover many pages but I am interested in relating but one aspect of it—the so called field duty for the physician here in Germany. It seems catastrophic enough when one is plucked from active practice and placed into the Army Medical Corp to serve out his time but then when he finally does arrive at his duty station only to find he is attached as medical officer to an artillery unit or a tank company the gloom seems to seal him over completely and he thinks his entire professional career is gone.

It is only after a while that he begins to appreciate the importance of his job as a medical officer in a group of men and the responsibility of having a command. He finds out how the Army gets the job done. He realizes that the training he is getting is the kind of thing that is going to pay off when and if that day of oblivion should arrive and the U S goes into all-out war. He is being trained to be a good Reserve officer and he knows it. It becomes apparent too that his professional career is far from ruined or upset and that this interjected change is but part of the overall training that is going to make up our doctor of today.

The Seventh Army is doing a fine job of training its men to prepare themselves for the defense of our democracy. It is also doing a fine job of training our doctors to back them up when and if the need should ever come. I am proud to have served with the Seventh Army and I would like to thank them for the training I have had.

Sincerely

A Civilian Physician Away From Home

A MESSAGE FROM THE A M A

In the June issue part of the first year's results of an opinion survey conducted by the Council on National Emergency Medical Service of the American Medical Association in connection with physicians being released from active military service was summarized. The remainder of the results of the survey are summarized here.

Reserve status Most of the physicians answering the questionnaires indicated that they still had their reserve commissions. The percentage was somewhat higher in the Navy than in the Army or Air Force.

Government-paid medical education A majority of those responding had received assistance in their medical education from the Government. A total of 754 said they had received no assistance. The program under which the largest number had received assistance was the Navy V 12 program while the next largest number received assistance under the Army Specialized Training Program. Some received training under the "G. I. Bill" through the Veterans Administration and several listed a combination of various programs.

Training received while in service A total of 1,371 of those who served in the Army, 1,691 in the Navy and 856 in the Air Force stated that they had received additional training or experience in service schools including the Medical Field Service School, the School of Aviation Medicine, Amphibious Forces Training, et cetera.

Evaluation of medical military training A majority of the physicians filling out the questionnaires believed that all important features of military medical training had been covered. A small number stated that the training was unsatisfactory, with no reason given. Others stated it was unsatisfactory and gave their reasons. About 20 percent did not respond.

Evaluation of assignment A large majority of the physicians (82.3 percent of those in the Army, 79.5 percent of those in the Navy and 81.9 percent of those in the Air Force) indicated they were properly assigned. A less decisive majority (about 46.4

F m h Council on National Emergency Medical Service of the American Medical Association
A t t h i s and p e r s e d r n t s s r l y t h o f t h
D p t m t f D f —Editor

percent of those in the Army 69.9 percent of those in the Navy, and 39.6 percent of those in the Air Force) however responded favorably to the question as to whether they were properly rotated

Assignments One of the questions was designed to determine the amount of time spent by physicians on various types of assignments. Many of the respondents neglected to answer the question and others answered it only in part. For this reason the analysis is confined to the amount of time spent on the treatment of military personnel and their dependents in the United States and overseas. The survey shows in terms of percentage distribution by allocation of duties that of those assigned to domestic duty stations 53.4 percent were engaged in providing medical care for military personnel 28.3 percent in providing care for dependents of military personnel and 18.3 percent on other assignments. Of those assigned to overseas duty stations 51.8 percent were engaged in supplying medical care for military personnel 23.8 percent in caring for dependents of military personnel and 24.4 percent on other assignments.

Types of nonmilitary medical care provided There were questions designed to determine the type of medical care provided by physicians in uniform for other than military personnel. The answers disclose that in the Army and Navy the type of medical care most frequently provided was outpatient care while in the Air Force it was obstetrics and gynecology.

Duties that could have been performed adequately by other personnel A total of 3,448 physicians answered the question relating to duties which could have been performed by other personnel. About 41.4 percent in the Army 49 percent in the Navy and 65.7 percent in the Air Force stated their duties could have been performed by other personnel such as nurses enlisted personnel civilian medical personnel health personnel other than physicians and others not specified.

Physicians who would voluntarily remain in service In response to the question "Are there any conditions under which you would have been willing to serve beyond the required two years?" 1,616 physicians (49.5 percent) indicated they would not be willing to stay in service for more than their two years of obligated service under any circumstances 2,144 (57.5 percent) answered yes under certain specified conditions 54.8 percent in the Army 55.6 percent in the Navy and 52.7 percent in the Air Force answered yes.

If copies of the complete results of this survey are desired address your request to Secretary Council on National Emergency Medical Service American Medical Association 535 N Dearborn Street Chicago 10 Ill

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A MANUAL OF TROPICAL MEDICINE by *Th. ma. T. M. k.* M. D. Col. nel. MC. AUS. (R. t. r. d.), Chaurma. The. Am. c. F. und. to. for. Trop. al. M. d. ne. Co. ult. t. Top. l. M. d. c. ne. Th. Roo. lt. llo. p. l. N. w. Y. k. C. ay. The. V. Adm. trat. H. p. tal. W. t. H. Conn. d. Th. N. rw. lk. H. p. tal. N. rw. lk. Co. n. F. rme. ly. P. f. f. P. M. d. ne. W. k. F. t. Coll. g. Th. B. wma. Gray. School. of. M. d. G. g. W. H. t. Ill. Ph. D. C. l. l. MSC. USA. Chief. S. t. f. P. of. gy. E. t. m. l. gy. Furth. Army. Ar. M. d. l. L. b. rat. y. Bro. k. Army. M. d. l. Ce. t. F. r. S. m. H. t. T. P. r. f. f. P. ra. l. gy. Affil. d. U. t. f. th. Graduat. S. h. l. B. yl. U. rs. ty. F. r. m. ly. Ch. f. Dep. tme. t. f. M. d. l. Zo. l. gy. 406 b. Med. l. G. ne. l. L. bor. t. ry. T. kyo. J. p. d. C. Bro. k. W. th. M. D. F. ld. Staff. M. mbe. D. f. M. d. c. d. P. bl. ic. H. lth. Th. Ro. k. f. ll. F. und. t. 2d. d. n. 907 p. g. 304 ill. tr. t. 7. lo. W. B. Saund. Co. Phil. d. lph. P. 1954 P. \$12

LABORATORY INSTRUMENTS Their Design and Application, by *A. Elliott* Ph. D. D. Sc. Courtaulds Ltd and *J. Home Dickson*, M. Sc. Royal Naval Scientific Service. 414 pages illustrated. Chemical Publishing Co. Inc., New York N. Y. 1953. Price \$7.50.

TOXICITY OF INDUSTRIAL ORGANIC SOLVENTS Revised in consultation with the Toxicology Committee by *Ethel Brown* ng. Reprinted by permission of the Controller of Her Britannic Majesty's Stationery Office. British Crown Copyright. 411 pages. Chemical Publishing Co. Inc. New York N. Y. 1953. Price \$8.

FUNDAMENTALS OF NEUROPATHOLOGY by *William Brooks Dublin*, M. D. Chief Laboratory Service Veterans Administration Hospital Associate Professor of Pathology University of Colorado School of Medicine Consultant in Neuropathology Denver General Hospital Denver Colorado. 685 pages illustrated. Charles C. Thomas Publisher Springfield Ill. 1954. Price \$18.50.

FRENCH'S INDEX OF DIFFERENTIAL DIAGNOSIS edited by *Arthur H. Doubt* M. D. F. R. C. P. Senior Physician Guy's Hospital, Honorary Physician All Saints Hospital for Genito-urinary Diseases. 7th edition. 1046 pages with 731 illustrations of which 200 are in color. The Williams and Wilkins Co. Baltimore Md. 1954. Price \$20.

WORLD-ATLAS OF EPIDEMIC DISEASES Part I edited by Professor Dr. med. *Ernst Rodewaldt* under sponsorship of Bureau of Medicine and Surgery Department of the Navy Washington, D. C. 130 pages 41 maps. Falk Verlag Hamburg 1. Burchardstr. 8 Germany. Price 225 Deutsche marks plus postage.

DEATHS

LOVSHIN William Clarence Captain, USAFP (MC) 515th U. S. Air Force Infirmary Duluth Municipal Airport Duluth Minn. graduated from University of Wisconsin Medical School in June 1947. ordered to active duty in April 1953. died 31 May 1954. age 28. from injuries received in an aircraft accident near Duluth Municipal Airport.

PHELPS Donald Lee Lieutenant 3rd grade (MC) USN USCG. Honnington, entered the military service 17 May 1938. commissioned as ensign 1 October 1950. died 26 May 1954. age 34. from the results of an explosion on board the *Bermington*.

PORTER Ruth Scott Captain, USAF 21st Central Postal Directory Chateau, France. graduated in 1926 from the Mc. Center Hospital, School of Nursing Columbus Ohio entered the military service 1 September 1945. died 1 April 1954. age 50. of myocardial infarction while on duty.

THOMAS Clyde Dana Lieutenant (MC) USN USCG. Honnington, graduated in 1948 from University of Maryland School of Medicine. entered active duty 14 November 1953. assigned to duty on the *USS LST-1161* at May 1954. age 29. from the results of an explosion on board the *USS LST-1161*.

BOOK REVIEWS

SPATIAL VECTORCARDIOGRAPHY by G. E. B. M. D. J. A. Abld
kov M. D. d J m s A C mvi b M S 173 p g w th 121 illus
tio L. & F b g Ph l d lph P 1953 Pr ce \$5

This book is an interesting and valuable introduction to the subject of spatial vectorcardiography. It consists essentially of material previously displayed in an exhibit at the meeting of the American Medical Association in June 1952 and published in various leading medical journals. The first half of the text is a clear and concise presentation of the method of recording the spatial vectorcardiogram by use of the cathode ray oscilloscope; this includes a brief introduction to the mechanism of the oscilloscope as well as a discussion of reference frame and standardizing factors. The second half presents the spatial vectorcardiogram of the normal person and of several patients with abnormal cardiac findings. Because of the small number of patients presented and the lack of anatomic confirmation of the cardiac lesion, interpretation of the authors' results must be made with caution. It seems clear by the authors' admission that future studies in vectorcardiography must include (1) standardization of the reference frame, electrode positions and nomenclature and (2) correlation of many vectorcardiograms with anatomic findings at postmortem examination.

In view of enthusiastic claims made elsewhere, it is heartening to note that the authors do not wish to replace electrocardiography with the vectorcardiogram and indeed believe that the spatial vectorcardiogram is of limited supplementary value to the electrocardiogram.

—THOMAS W. MATTINGLY, C. L. MC, USA

DISEASES OF THE RETINA by H. M. Elwyn, M. D. 2d ed. 713 p g
w th 243 illustrations f wh ch 20 lor Th Blakist Co l
N w Y k, N Y 1953 Pn \$12

The second edition of this work is a welcome addition to the physician's library. The principles of basic physiology are first presented in a clear manner. Based on these principles, the physiology of that portion of the retina is discussed, and finally the response of the organ to the abnormal condition is presented. The author has omitted discussions of rare retinal diseases and lesions in writing this practical book.

Diabetic retinopathy is discussed from a physiologic viewpoint. Although all might not agree with the author's suggestion that the high blood sugar over a long period of time is the cause of the dilatation of the terminal vessels in the retina, the physiologic reasoning behind

the conclusion is certainly reasonable. A timely discussion is presented in the revised chapter on essential arterial hypertension. This chapter, not too clear in the first edition on the differentiation between the retinal changes of hypertension and arteriosclerosis, has been clarified. The recognition of the difference between the two conditions is not just one of academic interest; for example, a hypertension resulting from an arteriosclerotic process cannot be expected to respond satisfactorily to a splanchnicectomy. In addition to other tests, the correct interpretation of the retinal vessel changes is important.

The subject of tuberculosis is introduced in a separate chapter in accordance with the author's plan of presenting the basic physiology (or in this case basic pathology) first, then in a succeeding chapter interpreting such data as it affects the retina. Current concepts of retrolental fibroplasia, hereditary degeneration of the retina, and sarcoidosis are presented. They are not approached dogmatically but are presented to bring the reader abreast of current thinking.

This book should be in the hands of the ophthalmologist, but it will be of great value to the internist, pediatrician, neurologist, and neurosurgeon. — JAMES W. BROWN, Col USAF (MC)

A TEXT BOOK OF PATHOLOGY An Introduction to Medicine by William Boyd, M.D. 6th edition, thoroughly revised. 1,024 pages, 570 illustrations, and 32 colored plates. Lea & Febiger, Philadelphia, Pa. 1953. Price \$12.50.

This well-known work is an excellent text for the student of pathology. About 70 new sections have been added to this edition. Many of these are brief, but one entitled "Antibiotic Enteritis" is of particular value in emphasizing the hazards of injudicious therapy with antibiotics.

The author has given almost without exception the proper emphasis to the various entities discussed. The concise bibliography includes only outstanding works in an effort to afford the student the best with a minimum of extra reading. The book fulfills the author's purpose and is highly recommended. —FRANK L. ZIEHL, Capt. MC USA

PHARMACOLOGY AND THERAPEUTICS by Arthur Grollman, Ph.D., M.D. 2d edition. 866 pages, 127 illustrations. Lea & Febiger, Philadelphia, Pa. 1954. Price \$10.

The author's aim to continue the "severely critical and rigorously scientific" approach of Cushny's original text, which this volume replaced, has advantages and disadvantages. The book is well written in concise, readily understandable form. The organization and grouping of therapeutic agents according to their action on organ systems is desirable. There are many excellent sections, such as those on sulfonamides and antimalarials. The digitalis series is covered completely, and there is an excellent chapter on diuretics.

BOOK REVIEWS

SPATIAL VECTORCARDIOGRAPHY by G. g. E. B. b. M. D. J. A. A. b. l. d.
kov. M. D. d. Jam. A. C. nu. b. M. S. 173 p. g. w. th. 121 ll. tra.
u. ns. L. & F. b. g. Phil. d. lph. P. 1953 P. \$5

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accepted clock process having a fixed intermitotic period. The stochastic model appears to be followed in the mouse tumor known as dbr transplantable adenocarcinoma, as shown by the distribution of mitoses. A detailed analysis of the time parameters in the life of a cell is presented with special attention to the interpretation of the mitotic index, the duration time of mitosis, and the cell number doubling time.

The author suggests that accurate and properly interpreted data on cell size could be important not only in cancer cytology but also in assessing the range of volumes in any cell population. For one thing, adequate data would permit testing the ideas on which Heidenhain's law of growth and Hertwig's nucleocytoplasmic ratio are based.

The reports of other workers in this field are well covered by the 115 references cited, and the indexes are reasonably adequate, although not fully cross referenced. This monograph is designed for study and contemplation rather than for casual reading. It should inspire critical analysis and reevaluation of both methods and interpretations. Any cytologist or pathologist, as well as anyone interested in cancer control—and who is not—will find it stimulating.

—BENNETT F. AVERY, Capt. (MC) USA

THE YEAR BOOK OF PEDIATRICS (1953-1954), edited by Sydney S. Gellis
M. D. 435 pages, illustrated. The Year Book Publishers, Inc., Chicago
Ill. 1953. Price \$6.

This volume contains abstracts of selected reports from both domestic and foreign pediatric journals received between June 1952 and May 1953. The abstracts are divided into sections such as the premature and newborn, metabolism, infectious diseases, and heart and blood vessels. Each abstract has a complete reference to the journal in which the report was published, and the book is indexed both by author and by subject matter.

During the past year the advances in pediatrics have been considerable. The sections of the volume on the premature infant, the blood, and the heart and blood vessels are exceptionally well chosen. The text would have been enhanced, however, by increasing the number of articles in the section on endocrinology. The editors have appended bracketed comments where appropriate, and both critical and constructive comments are made. It is noteworthy that bracketed remarks by men well known as authorities in the particular subjects being discussed are frequently quoted. This greatly increases the value of the book as a review of the important recent literature.

This text will be highly useful both as a ready reference and as a broad review to the busy physician who desires to keep informed of the significant advances in pediatrics.

—ERNEST R. MOELLER, Capt. (MC) USA

standing of the patient and on respect for him as an individual. It is also based on a steadfast conviction that he can with help break his patterns of defeat.

Perhaps the nicest thing that a reviewer can say about an author's effort is that his is a book that the reviewer wishes he had written. This is such a book.—ROBERT E. SWITZER Lt. Col. (MC) USN

COMMUNITY PROBLEMS by J. R. Gruene Ph.D. 336 pages, illustrated. The C. V. Mosby Co. St. Louis, Mo. 1954. \$4.

An understanding of family and community problems arising as a result of illness will assist the nurse in her concept of complete nursing care. This book was written to help the nurses integrate social and emotional aspects in their clinical fields.

The first of three sections presents a general background of sociology and the nature of community problems. It is followed by a discussion of the social and economic problems due to various types of illnesses and the role of the community in these problems. The last section gives a summary and review of the existing programs and plans in the community, the state, and the nation. The student as well as the graduate nurse will find the references following each chapter invaluable as further sources for more detailed information. The graphs and charts found throughout the book aid in depicting the various sociologic trends. Appendix I contains a list of books, magazines, and sources for pamphlets and visual aids which will assist the instructor in this field of nursing education. The national agencies, both governmental and voluntary, are listed separately in Appendix II.

As a ready reference to the common community problems in their fields, the nurses and other health workers will find this book of great value.—AILEEN E. BRIMMER Maj. USAF (AFNC)

THE ROLE OF EDUCATIONAL INSTITUTIONS IN MILITARY RESEARCH by Robert E. Cron, Jr. M.S. 22 pages. C. M. G. Littlefield Tech. Library, Pittsburgh, Pa. 1953. Price \$1.

This monograph presents a brief and interesting review of the support rendered our armed forces during World War II by educational institutions in supplying technical personnel and facilities for research and development and in developing tactical weapons. Because modern tactical problems depend fundamentally on science and technology, particularly in basic research, it is pointed out that the role of educational institutions has become more important than ever to national security. Research accomplished by these institutions during the war and the postwar period is briefly reviewed and summarized. This monograph would be of value to anyone planning to present a public discussion on the general subject of the armed forces and research. A bibliography of 15 references is included.—WILLIAM H. LEE Maj. USAF (MSC)

RETINAL CIRCULATION IN MAN AND ANIMALS by I C Michaelson, Ph D
146 pages illustrated Charles C Thomas Publisher Springfield Ill
1954 Price \$6 75

This monograph is a complete presentation of the developmental and adult condition of the blood vessels of the inner eye of the vertebrates. The inner ocular vascular pattern found in each class of the vertebrates is given in a general summary with a more complete description of that found in the eel roach frog pigeon horse rabbit cat rat and man. The vascular patterns of the choroid and retina are correlated to demonstrate the importance of the choroid in the nutrition of the retina. The author presents evidence of the presence of factors in the developing retina which are capable of affecting the growth of new vessels.

The review of the development of the vascular tree and interpretation of the vascular conditions in the human eye will aid the ophthalmologist in the study of the ocular vascular diseases. Because many diseases of the eye involve the intraocular vessels this monograph should be of benefit in the future study of retrolental fibroplasia diabetic retinopathy occlusion of the central retinal vein Eales disease and hypertensive retinopathy. It will be of greatest value to the physiologist ophthalmic pathologist and ophthalmologist as a reference book and should be included in the libraries of institutions concerned with the study or treatment of intraocular vascular diseases.

—FREDERICK R CARRIKER Capt MC USA

METHODS IN MEDICAL RESEARCH Volume VI edited by J Murray St Lee
271 page illustrated The Year Book Publishers Inc Chicago Ill
1954 Price \$7 00

This volume with the quality and tradition of the preceding five volumes contains four essentially unrelated sections (1) methods for studying genetics (2) experience and methods of conducting environmental medical research (3) the use of statistics in medical research and (4) authoritative reports on the design and construction of metabolism cages for smaller animals together with descriptions of methods for the actual quantitative collection of expired air urine and intestinal excreta.

This book contains the work of many outstanding contributors and is exceptionally well edited. Although the reader may not desire to read all of the detailed technics described in each section the general approach to the described problems may prove of interest. The experimental methodology so well condensed into a single volume will save many investigators time in looking up methods already developed and proved by others in these fields.

This volume is a particularly pertinent reference for scientists conducting more basic types of medical and biologic research.

—FRANK L BAUER Lt Col MC, USA

PSYCHOSOMATIC CASE BOOK by Roy R Grinker M D and David P R
 bns M D 346 Pgs Th Blks Col N W Y k N Y 1954
 P \$C 50

This book introduces the reader to the basic principle of a psychosomatic approach in medicine by presenting clinical histories of patients suffering with various diseases. The authors review the various approaches by other workers to the field and suggest that the subject should be considered as a field — using the term in its sense as applied by the physicist—consisting of social somatic and psychologic components each of which is subdivided into many interacting forces. One might visualize all of these subdivisions as reverberating potentials capable of exerting their influence on the total field. The illusion thus created is at first rather breath taking and suggests to this reader that one might need a huge electronic calculating device to properly evaluate all the possible combination and permutations necessary in viewing the psychosomatic aspects of the case from the field viewpoint. Such an approach can only be accomplished by the team concept to include the psychiatrist internist psychologist sociologist and whatever other specialist might apply to the specific problem.

The book is divided into five major parts. After a review of the problem and suggestions for a broader viewpoint the authors own case material with particular emphasis on the psychological aspects is presented. The section on special syndromes neatly groups familiar entities into their respective systems and provides a comprehensive review of current thought in each particular system with excellent bibliographies at the end of each chapter.

In the section on therapy techniques for planning therapy and methods of treatment and discussion of the doctor patient relationship in therapy are outlined. The need for positive findings for making a psychiatric correlation in the case rather than accepting such just because organic disease has been ruled out is emphasized.

Workers in all phases of the field will find this a useful book. The case studies which were selected from what appears to be a wealth of carefully studied material will interest not only the psychiatrist but also specialists in other medical fields. Even the specialist or general practitioner uninitiated in the thinking of psychosomatic medicine will find familiar threads running through the case material that tie together and that will help him understand the psychosomatic aspects of his own specialty. When the reader finishes the book he may still believe that an electronic calculating device is necessary to study the psychosomatic problem properly from the field standpoint. However most will agree that the authors have skillfully presented a large segment of the approach that they have recommended.

—ROBERT L. WILLIAMS Major USAF (IC)

INSTRUCTIONS FOR AUTHORS

The *United States Armed Forces Medical Journal* is devoted to the publication of original investigation, observation, and clinical experience of interest to personnel of the medical services of the three military departments. Contributors who are affiliated with one of the military services in a commissioned, enlisted, or civilian capacity should forward manuscripts to the Surgeon General of the United States Army, Navy, or Air Force, Washington 25, D. C., in accordance with existing regulations. The covering letter should state that the author desires the manuscript to be given consideration for publication in this *Journal*. Accepted manuscripts become the property of the Armed Forces Medical Publication Agency and will not be returned.

MANUSCRIPTS

An original typewritten copy of each manuscript with wide margin on unruled paper, size 8 by 10¹/₂ inches, must be submitted. Carbon copies are not acceptable. All written matter, including reference, must be double-spaced. Articles are accepted with the understanding that they are submitted solely to this *Journal* and that they will not be reprinted without the permission of the editor. A brief factual summary, which is complete in itself, should conclude each paper. The editor reserves the privilege of editorial modification. The senior author will be furnished with a proof of his article prior to publication and with a generous number of tear sheets without cost in lieu of reprint. Authors are responsible for the accuracy of their statement.

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Reference to published literature should be listed at the end of the article in the numerical order in which they are cited in the author's text. Care and accuracy in the preparation will expedite publication of the article. Following are correct examples of references:

Fleming A, Young M Y, Suchet J, and Rowe A J E: Penicillin content of blood serum after various doses of penicillin by various routes. *Lancet* - 6: 1-6, 4 Nov. 11, 1944.

Cabot R C: Pernicious and secondary anemia of chloroform and leukemia. In Oler W (editor): *Modern Medicine*, 31 edition. Lea & Febiger, Philadelphia, Pa., 1950. Vol. 5, pp. 33-100.

FIGURES AND TABLES

Photographs should be black and white, unmounted and untrimmed, glossy print, preferably not larger than 8 by 10 inches in size. If the identity of a patient is recognizable in a photograph, it must be accompanied by the patient's general statement authorizing its publication. The magnification of photomicrographs must be stated. No mark, writing, or typing should be made on the face or back of photograph. The author's name and an identifying legend may be affixed to the back of each print with paste or glue, paper clip, pin, and staple should not be used. Special care should be given to the preparation of graphs and tables. They should be drawn or printed in black ink on white paper and should be accompanied by an explanatory legend.

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Manuscript tables and illustrative material should not be rolled or folded for mailing. Unused manuscript will be returned promptly to the author by mail to the editor. It is the responsibility of the author to receive receipt. Authors are urged to retain a carbon copy of their manuscript. Communications for the editor should be addressed to:

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Monthly Message

Dr Willard C Rappleye in an address at the Congress on Medical Education and Licensure 1954 narrated the history of medical licensure

Roger II of Sicily issued an edict in 1140 forbidding anyone to practice medicine who had not passed the necessary examinations The Fourth Lateran Council in 1215 issued additional rules in regard to surgical procedures Frederick II in 1224 extended the regulations promulgated by Roger II and even specified that the medical faculty of the University of Salerno should conduct the necessary professional tests The educational component of medical training was clearly stated even at that time when it was specified that a candidate must have studied philosophy for three years medicine for five years and to have practiced under a qualified physician for one year Please note that those educational conditions were laid down 700 years ago

Since then much effort has been expended in raising the quality of medicine In 1307 the King of France established a board of surgery in Paris to examine and certify those who wished to practice surgery Following this numerous royal proclamations were issued dealing with surgery In England both the university and barber surgeons had their own boards which were eventually merged under the great charter granted by Henry VIII This however was not altogether a happy marriage and for the next 200 years until the establishment of the Royal College of Surgeons in the eighteenth century there were still many disputes between the guilds

In our own country the past 50 years have seen the abolition of the diploma mills and the steady elevation and quality in the practice of medicine and surgery We must guard against overspecialization however and a return to the outmoded guild system toward which some of the specialty boards seem to lean In the words of Santayana "Those who cannot remember the past are doomed to repeat it

Frank B Berry

FRANK B BERRY M.D.
Assistant Secretary of Defense
(Health and Medical)

UNDERSTANDING THE "FEAR OF FLYING" SYNDROME

I Psychic Aspects of the Problem

LUCIO E GATTO *Colonel USAF (MC)*

WHILE "fear of flying" is only one of the many problems encountered in providing a competent air arm its presence in a command or an organization is often the cause of great concern and confusion to both commanders and medical officers. When skilled aircrew members who have been trained at great expense refuse to fly they cannot lightly be excused permanently from their duties. Nor can commanders unconcernedly obligate disturbed men to return to flying when it means entrusting them with the lives of others and with the complex, costly aircraft of this military era. This problem frequently leads to great indecision as to what action is proper to remedy the difficulties.

ANALYSIS AND DEFINITION

Because fear of flying is a complex problem with many ramifications, it behooves all who deal with it to attain as comprehensive an understanding of its nature as possible so that suitable decisions can be made. While most Air Force commanders and aviation medical officers realistically accept such tangible aviation problems as oxygen lack, the effect of gravitational force, supersonic speeds, and radical temperature changes, they frequently become perplexed and mystified when men presenting behavior disturbances fail to respond to authoritative exhortation or logical reasoning, and seem unable to exercise any will power. Although the medical officer may be aware of the presence of strong emotional forces in these problems, he is usually not aware of the effect or meaning of such forces because they frequently remain illusive and intangible.

EFFECT OF EMOTIONAL CONFLICTS ON FLYING EFFECTIVENESS. Because emotional disturbances can impair the effectiveness of flying personnel, it is important to recognize that a *psychic emotional homeostasis* is just as essential to men in military aviation as is the physical homeostasis provided by all the protective apparatus and devices that aeronautical and aviation

medical research has developed. Very often, valuable flying personnel may be lost more easily through the failure of the flier's psychic armor than through that of his physical armor. Too often the effect of emotional forces is disregarded when its recognition and relief would prevent the impairment of flying effectiveness. To deny the existence or the disastrous influence of such forces is as serious as to deny the insidiously harmful destructive effect of infectious bacteria because they too, may be invisible. These unseen forces may be just as destructive to psychic life as is a rapidly revolving invisible airplane propeller to the physical life of anyone stepping into the path of its violent but unseen motion.

Despite the highly specialized selection of flying cadets and the toughening cadet training process that flying personnel undergo they in no sense become immune to physical and emotional stress. Each one still may have his own specific physical or emotional vulnerability. For no matter what one may believe pilots are ordinary people as human beings they can be expected at some time or another in the natural course of their lives to develop physical or emotional illnesses. One might state unequivocally that they are entitled to their proportionate share of such illnesses.

Our experiences with the flying personnel of the Far East Air Forces indicate clearly that if the total Air Force mission of maintaining flying personnel in constant and effective flying readiness is to be successful harmful emotional disturbances must be uncovered and eliminated early enough to prevent such undesirable reactions as fear of flying. For when the emotional problems that lead to a fear of flying syndrome remain unrecognized many flying personnel are grounded permanently, either medically or administratively when they might have been made effective again.

Role of preventive aviation psychiatry. The use of a combined medical psychiatric and administrative approach to the fear of flying problem has been successful in the Far East in reducing the loss of many men who might have been involved seriously with a fear of flying problem.

In this area of emotional disturbances preventive aviation psychiatry conducted by well trained psychiatrists who possess a well grounded knowledge of Air Force life and problems has just as important a role in aviation as has preventive technologic aviation medicine in other aspects. Clinical experiences and psychiatric research on flying personnel as indicated elsewhere makes clear that preventive aviation psychiatry can deal early and adequately with the problem through recognition, investigation of situation and treatment of the various emotional

disturbances which may appear among flying personnel, if neglected, they may either lead flying personnel into disabling behavior, or cause them to give up their flying duties forever. Preventive aviation psychiatry is capable of playing an active role in maintaining flying personnel at that highly efficient level of functioning necessary for the proper and superior accomplishment of the Air Force mission.

Not only must the appropriate design of aircraft and equipment to permit "full faculty performance by the aircrew" and to prevent limitations or " * * * marginal human performance" be the goal of aviation research, but also a concomitant, stable "psychic armor" must constantly be available to protect the military flier from the harmful effects of unwholesome emotional forces which may also prevent "full faculty" performance and seriously impair flying effectiveness.

Combined approach to the problem For these reasons the "fear of flying" problem will be approached from a combined medical, administrative and psychiatric viewpoint so that a practical, workable guide, allowing suitable decisions based on real knowledge, will be available to medical officers and other interested persons in pursuing the investigation and evaluation of those affected by it. Only pertinent details are presented, rather than a comprehensive review of the entire problem. A more thorough psychodynamic discussion of deeper psychosexual and aggressive drives usually implicit in the problems, behavior, and attitudes of these men, is available elsewhere.¹⁻³

While the number of men who give up flying for this reason is relatively small in comparison to the number who continue to fly, newspaper accounts at times have magnified the problem in the eyes of the public. The connotations of the phrase "fear of flying" certainly may have played a deleterious role in any program aimed at inspiring the youth of America to seek a career in military aviation⁴ by justifying their fantasies concerning its dangers.

CLUES TO THE FEAR OF FLYING SYNDROME. Clues leading to a better understanding of this problem are found in the following statement submitted by a highly regarded and very capable officer who insisted on being grounded because of an "uncontrollable fear of flying" even though he had not undergone any personal life-threatening experiences of physical impairment. Its importance is such that it is given here as presented in an earlier article with some enlargement and revision of the discussion.⁵ He stated:

The reason for the submission of this resignation is that I have a definite "fear of flying." My fear of flying is comparable to the fear

I would have if I were being forced to watch a truck drive down the street and crush one of my children. It is a fear that a person has when he knows a horrible death stalks or awaits him. It is a fear that causes me to lose all the good common sense that I possess. It too is a fear that is difficult for me to admit to anyone nevertheless it is a positive fear and I am forced to swallow my pride and make this admission. I am not a coward. I believe that I am mentally in a position to understand my fear. I feel that I know what I can accomplish well as what I cannot accomplish. I feel that I cannot satisfactorily accomplish any duties that will involve flying. I feel that if the Air Force insists that I fly it will only cause me to become so mentally ill that they will soon be forced to relieve me of my flying duties and because I will be of no value to them in this condition eventually release me from the service. Being mentally ill I can be of no value to my country as a serviceman nor of value to myself my family or my country as a citizen.

Due to my having this uncontrollable fear of duties involving flying I also ask that I be grounded and relieved of any flying duties pending the outcome of this request.

What reaction occurred in this pilot to create such a drastic change in his attitude toward flying when previously he had shown no overt dislike for or difficulty in his flying duties? Was it just the basic fear of being maimed mutilated or killed by falling through space and being smashed against the earth with devastating force? If it were why had he been able to fly so competently in the past? Was he really incapacitated for flying? An examination of his case history reveals some interesting clues toward understanding the fear of flying problem.

Case 1 Phobic (?) fear of flying This senior pilot had been involuntarily recalled to flying after he had established himself in civilian life. He had a well paying job. He was now happy in a second marriage and had two young children. His first marriage had failed primarily because of his long separation from his wife during World War II. Despite his reluctance over returning to active military duty and a definite determination to give up flying forever at the completion of his present active duty tour he had proved himself so capable and effective in his flying and military duties that he was assigned to the responsible positions of squadron operations maintenance and flying safety officer. His persistence of application and inherent conscientiousness which manifested itself in a high sense of self discipline and a constant interest in the performance of his duties won the regard of others in his unit and helped to maintain the organization's flying fitness at a high level. He was constantly concerned however for the lack of new replacement parts necessary to prevent failure of aircraft. He believed his repeated requests and suggestions to superior of

ficers for improvements in maintenance and flying safety which he believed absolutely necessary were not sufficiently supported or heeded

When he flew missions himself he would be leery at the controls for fear something would go wrong. As though to verify his fears a fatal crash occurred in which because of his various responsibilities he played an important reality role. He had been instrumental in causing the transfer of a B 29 pilot from his previous duty as pilot training officer to "milk run weather flights" because the pilots whom this flier had been training complained repeatedly of the excessively severe test flying situations to which he would subject them. On his first weather flight following the transfer this pilot and his entire crew were killed when a faulty engine which could not be turned off broke loose from excessive vibration and struck the body of the aircraft causing it to crash. The accident might have been avoided if the pilot had chosen to land at a nearer base but he had elected to try to fly the crippled aircraft to his home base.

As flying safety officer this pilot had to investigate the fatal accident. He blamed himself openly for the part he had played as operations officer in the course of events leading to the fatality and expressed frank remorse over transferring the dead pilot into milk run weather flying. "His feeling about the pilot was that he was immature looking but was more careful and thorough than he appeared. I made him an instructor pilot because he was very capable. However he could not get along with his students. He would do tricks to make things happen so that the other pilots said he was not teaching but being dangerous. He was mad at me when I put him back on the milk run but he let me down. I did not associate with him because of his moral standards. He was rough yet he would go out of his way to do things for his worst enemies." This pilot's inner turmoil over the failure of those in authority to harken to his ideas is disclosed in such statements as: "Command frequently acted unaware of the difficulties we had in maintenance or they didn't do anything about it. We were told to do the best with what there was available but they didn't seem to care. In flying maintenance is a matter of life and death. At the accident finding board he believed they were grinding away at him because he knew the score. Maintenance was dangerous but he had done his best."

Comment: In discussions with him it was evident that the combination of his ambivalent feelings toward his superiors and his overt guilt feelings in relation to the dead pilot and crew had caused him to lose faith not only in his superiors, but also in his own attitudes. Where previously his self-discipline and his desire to conform to military rules and authority had always helped him to perform his duties energetically and effectively, he was now willing, as a new defense against his underlying anxiety, to abandon conformity and suffer the consequences.

While he had not suffered any actual harrowing experience which might have excited the normal fear of the dangers of flying, it can be seen that his emotionally charged reactions displaced themselves from their original source (his relationship with authority and with the dead pilot) to focus upon the basic fear of flying which despite a lack of real interest in flying as a permanent career he had always controlled.

BASIC UNIVERSAL FEAR OF FLYING The basic fear of flying which we must recognize as common to all of us only serves as a focal point upon which anxieties generated from other emotional conflicts can accumulate to appear as a deceptively phobic fear of flying. This displacement of anxiety from its original source to other objects is a common enough phenomenon and when it reaches phobic proportions the person may choose either a harmless or a dangerous object to fear. It is easy to recognize that when the feared object or situation is harmless or unreal as for example an attack by mythical dragons the anxiety must have another source usually an internal unrecognized emotional conflict. It is more difficult however to recognize that this displacement can occur when the anxiety is attached to a situation which in reality is highly dangerous, as is flying. In this pilot's case the energies deriving from turbulent and disturbed emotions relating to others, the confused feelings about his own attitudes and the very visible guilt that he felt over the loss of an admired but overly aggressive pilot combined and manifested themselves deceptively through an uncontrollable fear of flying.

This pilot's fear of flying though the result of his emotional conflict, was not really disabling. During the investigation he revealed himself to be a well controlled friendly self-assured person with slight visible tension but no evidence of disabling anxiety or somatic disturbance. He had had no trouble in flying from his base in Japan for the evaluation. He admitted that he could still fly but claimed that his emotional reaction to the whole situation was so great that he was willing to give up everything to avoid further flying. After his decision to terminate flying he had no further feeling of anxiety in fact when he submitted his resignation even though he knew its possible punitive or stigmatizing consequences he felt as great a sense of relief as though an oppressing burden had been lifted from him bodily. This burden of guilt assumed because of his part in the fatal accident might well have caused him unconsciously to fear the retribution of omnipotent superior or magical powers. His fear equivalent to being forced to watch a truck drive down the street and crush one of my children was his foreboding of disastrous things to come which he should not challenge in any way.

On analysis, his decision to give up flying can be seen to serve two purposes: atonement for his part in the fatal crash and separation from the service as early as possible. The unconscious attempt at self-punishment would be satisfied by the loss of his flying commission and by separation from the service under less than honorable circumstances. In turn, this separation from military service, into which he had returned only reluctantly and toward which he no longer had acceptable feelings, would be accomplished much earlier than his normal tour of duty would have allowed. That his feelings of guilt would, he believed, be expiated through separation is clear from his statement: "I would even take a dishonorable discharge, but I know and my people would know that I am not dishonorable." During psychiatric discussion, despite his ability to understand quite clearly his emotional problems relating to his "fear of flying," he elected to remain grounded. Because at the termination of his psychiatric review he showed no true anxiety relating to his flying, the problem of his disposition became an administrative one.

The emotional factors that stimulate the production of anxiety and its subsequent displacement to the more basic "fear of flying," stand out in bold relief in this case. This is not true in all cases. Frequently, unrecognized but truly harmful emotional factors are so obscured and difficult to recognize that only a patient and thorough psychiatric investigation will uncover them.

Role of basic universal "fear of flying" At this point, one may ask what actual part in the problem is played by the basic, perhaps universal and instinctive "fear of flying." Undoubtedly, all persons who desire to fly—that is, to be sustained in the air with no visible support from the ground—originally possessed a basic, perhaps instinctive "fear of flying," through the knowledge that a failure in the mechanism of being sustained in the air could result in injury or death by falling through space with great force until impact is made with the earth. This fear is merely another expression, whether fully instinctive or partially learned, of the fear of death, injury, or mutilation. Those of us who fly only as passengers need only suppress or tolerate this basic fear temporarily in order to have confidence, during a flight, in the fliers in whose hands we place our lives for safekeeping. Those, however, who participate actively in sustaining themselves in the air by controlling and determining the movements of the plane must necessarily have taken more permanent adaptive measures which permit them to function proficiently and safely in their flying duties. Although they know initially that flying was dangerous, they were able to adapt psychically and physically to their new environment in order to fly safely.

When therefore previously effective pilots who already possess training and experience and for whom flying has been both profitable and pleasurable become fearful of flying or as a manifestation of fear present disturbed behavior or physical symptoms which interfere with a suitable adjustment to flying it becomes very difficult to lay the blame solely on the original basic fear of flying. We must look in another area to understand a disturbed pilot's difficulties and recognize that as in the case described above conflicts insecurities and frustrations of many types play a much greater role in the fear of flying syndrome than does the basic perhaps instinctive fear of death or mutilation which is inherent and ever present in the unnatural act of flying itself.

Definition of fear of flying syndrome The fear of flying syndrome may then be defined as a complex reaction occurring among previously adjusted flying personnel and characterized by various defensive and maladaptive behavioral processes which express excessive anxiety over various external and internal conflicts frustrations insecurities and dangers as such it is distinct from the basic inherent fear of being maimed mutilated or killed by falling through space and hitting the ground with great force. It may be characterized by statements of uncontrollable fear of flying (pseudophobia) or by frank refusals to continue flying but more often it manifests itself in one or several of the following maladaptive patterns of behavior (1) Obsessive over concern related to the functioning of the plane (2) true phobias (flying claustrophobia et cetera) (3) psychosomatic disturbances of many varieties and degrees (4) behavior disturbances revealing inadequacy or delinquency (emotional instability reactions passive and/or aggressive reactions alcoholism and malingering) (5) true neuroses (6) pseudopsychoses and (7) true psychoses.

With the exception of the aeronautic frame of reference these expressions of maladaptation parallel almost exactly those commonly found in army combat reactions.

DISCUSSION OF ORIGINS OF FEAR OF FLYING

The origins of the fear of flying syndrome are to be found in those conflicts common to all men whether in a civilian or military setting. This syndrome as is the case with other problems of maladjustment is generated by the conflicting demands made on a man by his instinctual needs the internalized authority or superego and external reality. These basic factors in psychic adjustment are interdependent and increased stress on one affects the others in the same manner that stress on one link in a chain affects all its links. As revealed by our clinical research experiences the basic factors representing important areas of

conflict in this syndrome are listed below. Various case histories to be presented later will clearly demonstrate their effects. Some knowledge of the military aspects of these factors will provide a better understanding of their operation in the "fear of flying" syndrome. They include:

Instinctual needs. Interpersonal relationships (libidinal ties, identifications, and object relationships), need for self expression (love, aggression, dependency and security, excessive restrictions or freedom in expression of these instincts).

Superego forces. Structure and demands (personal integrity, loyalty, guilt associations, punishment, and "magical sense of omnipotence").

External reality. Reality goals (in relation to motivation, age, experience and assignments), incentives (their availability, attainability, incongruities and satisfactions), acts of fate, or chance (dangerous or harrowing experiences), problems of self survival versus physical environment of aviation, and opportunity for success or failure in combat.

CONFLICTS OVER INSTINCTUAL NEEDS. Disturbances in personal relationships and libidinal ties which stifle the need to express affection or resentment in suitable ways can excite, in susceptible persons, excessive anxiety which then is channeled into disturbed or distorted defensive behavior.

In this process there is regression from previous good adaptations to more immature and infantile behavior. Earlier modes of behavior that served, consciously or unconsciously, to gain sympathy through illness or weaknesses, or even to invite punishment and loss of love through bad acts, are revived in attempts to handle these conflicts. Difficulties are vividly projected on a seemingly unkind environment through rationalizations supported by only the flimsiest of evidence. Rumination and preoccupation over past misdeeds or failures appear. The "magical sense of omnipotence" so important to the ease of mind needed in successful flying is replaced by unexplained fears of retaliation or feelings of imminent threat to existence from the surrounding environment.

Emotions of resentment and anger that cannot be expressed adequately, and beliefs that prestige or importance are being denied, belittled, or challenged, often become displaced into complaints over totally unrelated difficulties, especially in those men who possess overly strong superego or conscience structures which prohibit open aggression. This is especially true in situations where mild expressions of aggression and hate, and even of love and affection, are except under very special circum-

stances greatly restricted or forbidden. Defiance of authoritative figures for whom markedly ambivalent emotions are felt is possible only for the few who dare to face the consequences. More commonly when such frustrated feelings become quantitatively unmanageable because of the anxiety they stimulate many men consciously or unconsciously set up compromise reactions which may take their toll on physical and emotional effectiveness. In the "fear of flying" syndrome only a few are capable of stating their emotional difficulties directly by saying "I cannot and will not fly anymore." Most as we shall see must express these disturbances symbolically by developing ineffective behavior or real or imagined physical symptoms.

CONFLICTS OF SUPEREGO FORCES AND PRESTIGE VALUES A paradoxical change has taken place in military aviation. While costly aircraft have become increasingly complex, highly evolved machines requiring special ingenuity and exceptional abilities upon the part of the pilots who fly them, the prestige importance and glamor formerly accorded these fliers has considerably decreased.

Previously in both World Wars I and II pilots were regarded with awe and high respect and often treated like vaunted heroes of old if not always on a national scale at least in their home localities. Now except for those pilots who become aces or "MIG killers" or who perform extraordinary feats like breaking the sound barrier flying at previously incredible speeds or for thousands of miles in astoundingly short periods of time most fliers receive little recognition or acclaim especially if they fulfill only routine flying missions such as carrying out defensive missions bombing supporting ground troops or transporting cargo or troops. They usually go unnoticed almost completely even in their military environment unless they become involved in some personal or occupational difficulty, or develop a fear of flying. That this lack of recognition may even be the lot of many fighter pilots who work diligently at their jobs but fail to attract attention is clearly demonstrated by a recent statement made by a leading jet ace. When I went overseas not even my wing man would listen to me now I'm an expert on world politics, a philosopher an actor and I don't know what all. Routine military flying now rarely is the source of more than casual passing interest. The military services look upon aviation only as a normal and necessary part of the total war machine needed by a powerful and wealthy nation. Most of the public now accepts military aviation with very little of their earlier wonder and amazement over what once appeared to be a magical if not miraculous accomplishment. Aviation now is big business which though requiring a few important people depends on the labors of many obscure people who regardless of the difficulty of their

duties, excite little general interest. Observe the mammoth Globe masters gracefully flying through the air and remember that, unlike some "MIG killer" pilots, not one of their pilots is nationally known.

The satisfactions accompanying personally desired types of flying or duty assignments often come in conflict with the Air Force's need for useful as well as versatile pilots. Because certain types of persons do better in specific types of flying, versatility versus utility becomes a major problem. The Air Force with its ever changing frontiers and military needs frequently must force persons into types of flying they would never choose for themselves. If they enjoy their assignments many pilots will put up with personal frustrations and hardships which in less happy circumstances might easily precipitate emotional disturbances. This difficulty is also reflected in the "fear of flying" problem.

Reality goals and motivation vary in relation to time, underlying desires, responsibilities, and incentives. Pilots who during World War II may have flown almost without caution and at times with reckless abandon, with no real fear for their future, have now returned to flying with different attitudes and behavior. Some try to recapture their earlier abandon and relive their "wild oats" period in a devil may care way, only to find that they can revive these early experiences in memory but cannot relive them with ease. Now responsibilities and an ingrained dependence on many other persons in their daily existence have taken a stronger hold than they realize. Nevertheless, the majority of these men do very well unless their emotions are subjected to excessive stress by underlying resentment, ambivalence, or insecurity in personal relationships or by indifference to their abilities in relation to their status in the group.

Inequities and discrepancies in rank, pay and status in relation to age and experience can easily lower a man's evaluation of himself as he compares his abilities and previous achievements with others of higher rank whom he believes to be less able and experienced. This not only damages a man's effectiveness but also leads to difficulties in his assimilation into the total group. Stifled initiative, unreasonable restrictions, failure to make use of available talents other than flying, and boredom through inactivity or repeated needless repetition of unessential training frequently play invisible havoc with a man's ability to adapt to and accept his situation.

Failure to be accorded the regard he believes to be his due, especially if associated with doubt over his leader's ability, causes a man to lose confidence not only in his leaders but in

himself his aircraft and even in the Air Force. Though fact and fantasy may be intermingled in his reasoning his reactions are real and often harmful.

A leader's misconceptions of the meaning of leadership when expressed through harsh or inept management of the military duties and everyday life of those under his command can drastically affect the emotional attitudes of the men who must abide by his commands and foibles. As one famous author wrote *discipline is based upon trust and confidence*.^{*} A leader's qualities whether good or bad are mirrored in the attitudes and behavior of his men. The good leader cements the group together by building an esprit de corps as he works with them encouraging them in many ways. He praises when praise is indicated and criticizes only when it is really necessary. Men react adversely to constant negative criticism which uses don'ts or singles out men's honest faults for punitive purposes or as a means of enforcing discipline. The good leader tolerates differences of opinion and allows enough freedom of expression to develop his men's initiative and to give them a feeling of belonging, rather than one of oppression. But when unified action is necessary as in combat he guides his men with a firm assurance which brooks no marked dissension or slovenliness. When leadership means proper organization and when all the men are aware of each man's function in the group and are allowed some freedom of action leadership is both desired and enjoyed. The leader who rules only through regimentation and restrictions in a rigid setting to gain control of his men is unreasoning and unmindful of the men's ability to think and act for themselves. A leader who is indecisive and unreliable or overly punitive and inflexible not only distrusts both himself and his men but elicits the same response from those in his command. This is illustrated by one pilot's remark about his former commander:

He used the regulations to the limit to enforce his command responsibilities. He didn't take into account the human factor for if he had done so or exercised a little better judgment and understanding he would have gotten a lot more out of us. If this attitude was really widespread in this pilot's organization many difficulties would ensue. These problems frequently exert a strong influence on the "fear of flying" syndrome.

Patriotism is of the greatest importance in times of actual national danger or worldwide war but unfortunately for many men it alone does not ordinarily inspire them to take up arms and undergo military hardships in times of apparent peace or in response to high sounding abstractions such as we fight (in strange lands) for the peace of our nation and the world and for the happiness of all humanity. Men are courageous but their own personal needs often are far more important to them than the

needs of others with whom they may have little in common, or with whom they have no real racial or traditional bonds. While the recognition and acceptance of duty may appear to be in response to the dictates of patriotism, it is greatly influenced by external authority, by a man's sense of personal integrity, and by his loyalty toward himself and his group. This internalized authority, recognized as his superego or conscience, requires him to live up to the dictates of his society, military or civilian. When this conscience or superego is too punitive or too strong, insisting upon unremitting obedience, the anxiety arising from inner struggles often is channeled into behavioral or physical disturbances. The need in men with such strong or harsh superegos to develop real or imagined illnesses as the only allowable escape from the demands of reality has been long known but less frequently recognized. The physician would do well to be vigilant, and recognize when disturbed behavior or physical complaints indicate that they are caused by forces instigated by a man's superego rather than by conscious subterfuge or malingering. As will be pointed out later, the same superego or conscience can often be used to help a person resolve his problems and even to motivate his return to effectiveness. If a man's superego is deficient and he lacks real personal integrity, loyalty, and attachment, the medical officer will find it difficult to get him to accept his obligations. When such men are found hiding behind a "fear of flying" reaction, the medical officer must not hesitate to reveal their true motives so that proper action can be taken.

Success or failure depends upon a good relationship with the group. Each man's success or failure is chiefly determined by how well he makes himself a part of his group and how he handles underlying insecurities and conflicts within himself and with others in his environment. If he succeeds in handling the anxieties resulting from these conflicting relationships he does so by developing defenses that are suitable and acceptable to society, although they may cover up underlying inadequacies and neurotic difficulties.

Good adaptation means, despite these conflicts, to perform effectively in any situation while accepting certain frustrations and postponing the gratification of many inner needs until the proper time and place for their satisfaction. All of these conflicts are woven tightly into the warp and woof of the fabric of the fear of flying syndrome. To understand the meaning of these conflicts, each problem should be carefully unravelled.

PSYCHOLOGIC MANIFESTATIONS OF THE PROBLEM

EFFECT OF REALITY SITUATION External danger itself and even extremely harrowing specific experiences may not ordinarily be

enough to cause flying personnel to give up flying even though they may at times appear to precipitate a fear of flying reaction

Case 2 Mid air collision. An enlisted man riding as a passenger had escaped death in a mid air collision between two military planes only by parachuting to safety. Despite the fact that the two occupants of the other plane were killed he proceeded shortly thereafter to accept military flying training saying nothing of his previous harrowing experience. Much later during routine questioning following completion of his combat tour in Korea he revealed that this escape from serious danger had given him greater confidence in his ability because he believed he could face any other emergency situation which might present itself.

During the difficult combat period experienced by the Eighth Air Force in World War II when the fatality rate and loss of planes was so high that each mission had to be accepted with complete fatalistic submission many men openly expressed the desire and the need to give up flying. Most of them however did not allow themselves to give up. They continued to perform effectively even though death for many of them was imminent.

An illustration of a real experience that could have caused a pilot to quit flying for good is given in the following case.

Case 3 Threat of death from enemy action. A 23 year old F 86 pilot underwent an extremely frightening experience when he was shot down on his first combat mission. After struggling to release his canopy he ejected barely above the minimum altitude for bailing out injuring both knees. Upon reaching the ground he was at first unable to operate his radio and emergency equipment because of his confusion but finally was able to collect his wits and take proper action. He was immediately hemmed in on all sides by enemy small arms fire. On one evasive movement he was caught in an open area and about to be shot by the enemy but was saved by the strafing action of pilots from his squadron who flew cover to aid him. His main thought during his terrifying escapade was that he preferred to be killed than taken prisoner by the enemy. After one and a half hours of constant evasion he was rescued by a helicopter but entered the hoisting harness in the wrong direction. After being lifted about 150 feet he almost fell out because of his unsuitable position, but was gasped in time by the medical corpsman. Despite enemy action the helicopter pilot had to lower him to the ground in this precarious position so that he could be hoisted properly.

During psychiatric review it was evident that this pilot was a very stable person who maintained a state of equanimity both in his personal relationships and in his attitude toward the dangers inherent in his combat assignment. His motivation for flying was both strong and sincere even though he was keenly aware that he might still be shot down again and possibly even killed. He was not reckless or callous to

danger but accepted his dangerous experiences in a matter of fact manner. He resumed flying and completed his combat missions without further serious mishap.

Case 4. Severe flak damage. A 23 year old pilot underwent the unfortunate experience of having his fighter aircraft hit by severe flak on two consecutive combat missions. He succeeded in landing on the first occasion and bailed out on the second. He reacted with anxiety severe enough to require immediate hospitalization. After several days despite evident anxiety he began insisting vigorously that he be returned to flying.

While his eagerness was commendable it should have been recognized as an expression of persistent and excessive anxiety—not just over flying again but over a possible loss of group prestige—and of his great need to regain mastery over his environment in order to recover his "sense of omnipotence." His background indicated some minor accident proneness especially on the ground. Against his own better judgment the flight surgeon finally allowed him to return to flying and he crashed during a routine ferrying trip under mild instrument conditions. This pilot's harrowing experiences had not prevented him from flying but his excessive need to regain status led to a fatal outcome.

Comment. If the reasons for his anxiety had been better understood, this pilot might not have been lost, for here again as in the first pilot conflicts other than the basic fear of mutilation or death played important roles in producing untoward disturbances. This reinforcement of the basic fear of flying by other conflicts is also instrumental in developing the "fear of flying" syndrome.

EFFECT OF CONFLICT WITH INSTINCTUAL NEEDS. It is important to stress that, despite competition, frustration, fear of failure, and doubts over the motives and abilities of others, the great majority of flying personnel perform their assigned duties successfully. In this era of confused ideologies and cold war, no one is without some insecurity and conflict in his everyday life. Most of these men have learned how to deal with the basic insecurities relating to possible loss of love, affection, and prestige, and face fears of retaliation from the environment with equanimity. Some perform successfully despite underlying phobias and other neurotic traits because they can ordinarily control such difficulties during flying. But when a sudden surge of repressed or long avoided conflict gives rise to overwhelming anxiety, these men may lose their defenses and fail temporarily as is revealed in the following case.

Case 5. Syphilophobia in a successful pilot. A 30-year-old married pilot presented himself to the flight surgeon after eight B 26 night missions indicating he believed he had an unrecognized syphilitic infection which led him to fear that if he were shot down over enemy

lines he would soon become very ill because the enemy would not give him proper care. Investigation revealed that this captain actually had possessed a syphilophobia since 1942 when as a cadet he had become intoxicated and experienced sexual contact with a prostitute in a house of ill repute. Since that time he had had periodic episodes of excessive worry and guilt over this sexual exposure. Several months after the exposure he developed a small penile papule which was not considered venereal and disappeared without treatment. Off and on he would seek reassurance over an intermittent slight urethral discharge diagnosed as a mild chronic prostatitis. Despite medical reassurance and repeated negative findings for syphilis this obsession remained in the back of his mind. He lost no time from flying except for the two years that he served in a noncommissioned nonflying status as a master sergeant on aircraft duty. With the outbreak of the Korean conflict he returned to piloting B 29's still mildly obsessed with his secret worry over syphilis. It was only after he was transferred to Korea to fly B 26 night bombers that this obsession became so marked that it interfered with his performance of duty. His reaction was so serious that he was referred to both the psychiatrist and to the chaplain. He was so rigid and fixed in his guilt feeling over his past misdeed that even religious guidance failed to help him. When first seen psychiatrically he could not imagine that he could be helped in any way; however investigation revealed that he was a very rigid and compulsive person; he performed his duties satisfactorily but rarely with any evidence of real initiative or drive. He was a quiet fairly passive person who was accepted in the group but he rarely participated in most of the unit activities. While a master sergeant he had actually been very content with his nonflying enlisted status except for the difference in pay. In being transferred from B 29's to B 26's his personal responsibilities for the aircraft and his crew had been greatly increased. He had many doubts about his abilities to live up to the military requirement of his rank. His only motivation for continuing flying was that he could not obtain any other job with such excellent monetary returns neither as an enlisted man nor as a civilian. He had no qualifications other than a pilot's. He had no executive ability no real leadership ability. Before each of his night combat missions he would become nauseated and prior to flying force himself to vomit in secret. His anxiety would remain with him until he trapped himself in his secret then he would feel better. Before his ninth mission, however he felt so anxious and nauseated that he asked to be excused. This meant that another pilot and crew had to take his place. For the next few hours as he lay in bed he scourged himself for being a coward and was greatly alarmed that something would happen to his replacement crew. By early morning he vowed to himself he would turn himself in and give up flying forever. When he went to the flight surgeon however he could not bring himself to talk about his underlying feelings of inadequacy and failure but spoke only of his obsession concerning syphilis. It was evident that although on the surface this

man had appeared normal to his comrades and superiors underneath he was plagued with marked turmoil over his responsibilities and the necessary decisions that he had to make concerning his future

Comment This man's real difficulty—fear of being a failure in the eyes of others—motivated him to continue to try to fly when his real wish was to give up what flying meant to him. His retreat into guilt-ridden ruminations and obsessions might appear peculiar, but they represent his attempt to handle the problem of living up to real obligations toward which he felt inadequate. His conscience was such that, as he gained insight into the meaning of his anxiety, he was capable of readjusting and returning to full flying duty. Psychiatric assistance aided him in resolving those conflicts over responsibilities to the Air Force which might have made it necessary for him to face a "fear of flying" accusation.

CONFLICT WITH PRESTIGE VALUES The effect on flying efficiency of minor resentments over many reality factors is well demonstrated in the following case of a pilot who talked of "uncontrollable fear of flying" but who had no real anxiety. The only diagnosis which can be made in this case is "no psychiatric or physical disease found fully qualified for flying duties."

Case 6. "Fear of flying—an expression of conscious resentments After he had been transferred to a combat bombing assignment a 32 year old B 29 pilot with past experience as an instructor in single engine flying during World War II stated: "I am through with flying because when I fly I get worried. I'm upset and nervous. I don't want to be a problem but I have no confidence in myself or the airplane. I don't want to kill the boys through any ignorance of mine. Before it was just my neck but now it is different." He believed that he was no use to the military service, stated that he felt insecure about instrument flying, and insisted that if he were forced to continue he would fail. On psychiatric review it was evident that while this man was very forceful in stating his desire to give up flying, he really had no true difficulty. He was found to be well controlled with no evident anxiety but with a great deal of resentment over such matters as being forced to fly with younger, less experienced pilots who because of their higher rank occupied authoritative positions above him. Seven years after discharge from the service in 1945 he had been recalled at the same rank that he had possessed then and the fact that he now was older and more mature yet commanded less respect proportionally from his flying colleagues hurt him deeply. He also revealed that his wife was endeavoring to prevent his return to combat flying. No actual medical problem was demonstrated in this man which would warrant any treatment. After a discussion of his situation and those resentments based on reality he recognized the effect of his own feelings concerning prestige. He was returned to his flying duties either to accept them or to face administrative action if he decided not to fly.

Comment It is obvious that this man was reacting more to narcissistic injuries and a lack of ego gratifications surrounding prestige than to a true basic fear of flying

CONFLICT WITH STRONG SUPEREGO Many men with well structured superegos but with similar conflicts over basic needs frequently present, either on transfer to overseas assignments or early in their combat tours various forms of disturbed behavior or physical complaints Many have been handled effectively by flight surgeons who recognize the meaning of the symptoms

Case 7 Acute disorganization early in combat tour An interesting example is that of a young pilot who after 13 jet fighter missions dashed in a markedly agitated and disorganized state into his flight surgeon's tent in the middle of the night He appeared so disturbed that the flight surgeon thought he was delusional however instead of becoming alarmed the flight surgeon instituted immediate supportive treatment which included heavy sedation complete reassurance and as the patient recovered ego strengthening discussions After two days of therapy this pilot made a rapid recovery and went on to complete his combat missions

Comment In this case the medical officer must have carefully considered this man's total behavior present and past and was not rushed into making a rash decision regarding final action If this man had been immediately sent to a psychiatric hospital as mentally deranged his return to duty would not only have been delayed but might have been rendered difficult or even impossible Early repression of conflicts in this case was all that was necessary

In the following case of a man with a strict superego early psychiatric treatment helped him to adjust adequately

Case 8 Fear of flying syndrome in neurotically depressed pilot with excellent superego structure Shortly after his arrival in Japan, a 23 year old first lieutenant a B 26 pilot was hospitalized because of evident depression, feelings of anxiety crying spells fears that he would never see his family alive again and insistent demands that he be permitted to give up flying forever Early in his examination it became evident that he did not truly desire to give up flying and that his depression was a reactive one which occurred immediately after his separation from his wife of one year Previously he had approached his flying duties eagerly and had accepted his transfer from B 29 flying to B 26 fighter bomber flying with great enthusiasm Flying B 26's he had found to be personalized They had given him a real sense of exhilaration and personal prestige because unlike B 29's which required co-ordination of a group they allowed him complete control over the plane himself His past record revealed that he had been an excellent pilot and that he had planned to find a future either in military or commercial aviation During discussions he would vacillate

repeatedly between an almost childish plea to be sent home immediately and demands to be sent to Korea so that he could assume his flying duties as soon as possible. His indecision over his need to comply with obligations and his need to be dependent and to take no responsibility for his decisions was visibly mercurial. Actually it was only after he had left his wife and child that he developed any anxiety related superficially with his feelings that he would never see his wife and child again. During his transfer overseas he had been hospitalized at two other air base hospitals for short periods of time. His stay at each hospital was the same each time he would experience the same depression which with the psychiatrist's assistance and the encouragement of his wife who would fly to visit him would end in his decision to carry on. Psychiatric evaluation revealed a major point in the fact that this man had never faced any real responsibility on his own until he was ordered overseas. All through cadet training and as a B 29 co-pilot other stronger persons had constantly supported his efforts. Because he had a pleasing personality and was highly motivated for flying everything had been made "easy" for him. As the only child of a successful police official any conflict which arose during his growth and development was taken care of so that he never was required to make any marked effort on his own. While his father was described as a kind but strict parent this pilot looked upon him with great respect and a feeling that he could never measure up to his standards and achievements. It therefore became evident at this point in his career that he was entering into an active competition in which he was to prove himself or fail. His dependency needs and timidity in accepting the responsibilities of reality were in marked conflict with his fear of failure and loss of prestige. This need to succeed and to avoid failure in the eyes of those whom he respected and loved was used as a motivating factor in leading this patient back to his flying duties. Any other decision would have marked him permanently as a failure. His fears about facing responsibility and his basic superego and ego strength were used to encourage him to make a real adjustment. There was no real evidence of any other basic emotional instability. He quickly stabilized and by his own decision to accept military flying was sent to Korea again. He still knew, however, that he had the alternate choice of giving up his plans for a flying career and facing the consequences. Shortly after his arrival in Korea he showed a mild repetition of his original symptoms but this time, again with good emotional support from his squadron leaders and the psychiatrist, he was initiated into combat flying. Because of his good personality structure and his high motivation he became well accepted by his group. From that time on he flew successfully and completed his combat tour in an outstanding manner.

Comment. It would have been easy during this patient's psychiatric treatment to have precipitated in him a "fear of flying" syndrome with the result that, despite his excellent motivation and extensive training, he would have been lost to

military aviation and permanently stigmatized in his own eyes. No punitive attitude was assumed however and no threats of disciplinary action were made. Each time he showed definite signs of neurotically disturbed behavior the proper understanding of his underlying needs and fears and the proper direction of his strict but well integrated superego prevented his developing a fear of flying which would have led to administrative action. The resolution of his conflicts coupled with an appeal to his strong superego was sufficient to return him to a normal emotional condition and allow him to function effectively.

DEFECTIVE MOTIVATION Quite different in attitude and motivation is the case of the following man whose statement of "fear of flying" merits the medical officer's decision to return him to his flying duties with the diagnosis. No psychiatric or physical disease found. Fully qualified for flying duties. This diagnosis definitely implies that the man is considered physically and emotionally capable of performing his flying duties although he may still claim an uncontrollable fear of flying and even demonstrate a mild degree of visible anxiety.

Case 9 Lack of true motivation for flying A navigator referred because of fear of flying had actually been in a minor aircraft accident in the United States but at the time did not reveal any marked emotional reaction. On his way to an assignment in Korea he made no complaints upon arrival however he walked into the flight surgeon's office and stated that he was through with flying and no one could make him fly again. He was referred for psychiatric evaluation. Upon being interviewed he immediately stated "This won't help I can't see you getting me to change my mind." In the discussion that followed it was made clear that our intent was not to change his mind but to try to understand the difficulties leading him to make such a decision. It became evident that this man had never really been motivated for flying duties however because of his intellectual ability and some college background he had chosen flying training to avoid serving as an enlisted man in any other capacity. He believed that he could fly as readily as perform any other duties in his early training however he had been washed out as a pilot because of lack of coordination and assigned to radar observer training which he accepted even though he frankly admitted that at that time he had no true desire to perform these duties. This course of action gave him a commission as an officer. While still in the United States he had considered turning himself in for fear of flying but realized that had he done so drastic action on the part of administrative authority would most likely result in the loss of his commission and separation from the service. He waited therefore until he had arrived at an overseas theater where he believed he would simply be grounded yet remain an officer. This man was unmarried and had no real responsibilities except to himself. His only interest in the service was gaining a nice

comfortable assignment as a ground officer preferably in administrative work for which with his academic background he could qualify and which he would enjoy. He indicated that because he feared flying as a radar officer he would be a danger to his pilot and therefore he was of no use as a flying officer. Again it was obvious that while this man used "fear of flying" as the reason for giving up flying there was no true anxiety but merely a lack of motivation for flying duties and a negative attitude toward living up to the standards he had accepted when he was given a commission as a radar observer. This man was playing his cards skilfully to see if the military would either accept his game or call his bluff.²

In such men as the one described above, despite statements such as "I will not fly anymore because if I do I'll crash and kill myself," or "I don't want the responsibility of other people's lives on my hands" the medical officer must clearly recognize the presence of resentment and lack of motivation, and have no fear about returning these men to flying duty. If such men return to flying as most of them do, their instinct for self survival, previous experience and excellent training will usually protect them against any untoward results, and cause them to exercise control over their flying. Many who, although showing some degree of visible anxiety effectively ventilate their underlying conflicts as did the B 29 pilot can usually be led authoritatively back to their flying obligations. Those who continue to refuse to fly must face administrative action and accept the consequences. In these cases the medical officer must have the courage of his own convictions and the ability to take decisive action. These qualities are especially necessary for dealing with men who refuse to fly because of disinterest, selfish motives, absence of loyalty to themselves or the group or lack of personal integrity. They should be declared "No psychiatric disease found fully qualified for flying duties," with the recommendation that if they continue to refuse to fly they should face whatever administrative measures are deemed applicable according to established Air Force policies.³

CONFLICTS EVINCED BY ACUTE PSYCHOTIC AND PHOBIC BEHAVIOR. Frequently in the realm of borderline emotional or physical disturbances including various types of behavior, phobias, and psychosomatic complaints associated with flying the medical officer finds it very difficult to render a sound opinion. Based on good judgment and an intelligent understanding of the needs of the men and of the Air Force he therefore should be flexible in his attitudes and opinions until he can arrive at a suitable decision. A rigid system of categorizing may lead him into regrettable errors for if he believes that all cases suspected of "fear of flying" are actually such he may make gross mistakes similar to those made in other medical situations. For example rare

cases of bronchogenic carcinoma have been erroneously diagnosed as pneumonia by well qualified roentgenologists because the roentgenograms had been viewed at the same time as many roentgenograms of pneumonia cases. Superficially both may appear to be very similar. Because of such similarities the medical officer may be mentally set to put all cases in one category and therefore may fail to recognize other medical or psychiatric conditions which may require different treatment.

For example one man considered to be a fear of flying case actually was suffering from a marked anxiety reaction which occurred after he had completed his required missions. This is a common reaction which at times occurs upon withdrawal from dangerous situations.

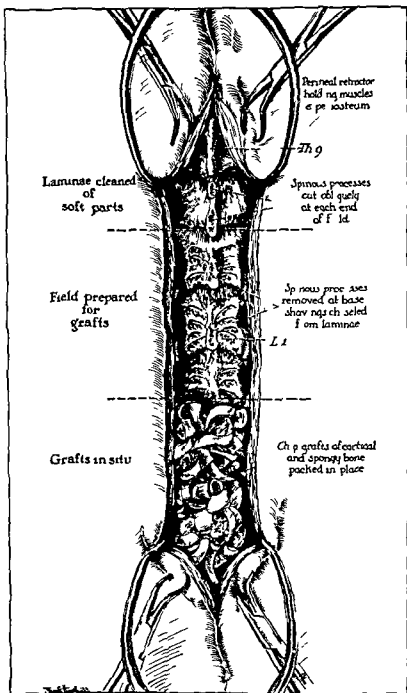
Case 10 True phobic reaction stated a fear of flying. A 25 year-old pilot who had been chosen as a distinguished flying cadet and given regular Air Force commission because of his outstanding achievements had after his return from combat flying displayed marked anxiety over renewing his routine patrol flying in jet aircraft. He had actually completed 26 fighter missions in Korea on a temporary duty status from his base in the Philippines. Following completion of his mission he had been inactive doing no flying for about six weeks. Upon his return he displayed a great deal of verbal anxiety about returning immediately to regular flying and insisted that he be first given some check rides with an experienced pilot. This odd behavior plus conflicting statements made by observers who described his combat flying as erratic indicated his combat flying was average for a first exposure to combat led his squadron superiors to believe that he had developed a fear of flying. He was later seen by a medical officer who although recognizing his anxiety state took no steps to obtain further assistance in working out his problem. The arguments and indecision over the disposal of his case were so prolonged that in desperation over the confusion this pilot actually signed a fear of flying statement admitting he was afraid. But later in view of the fact that he had an excellent past record he was finally referred for psychiatric review where it became evident that this anxiety reaction following combat was real and of a type seen frequently enough among men following relief from combat tours. In these instances other internal conflicts chiefly related to status within the group and to the fear that despite present survival something must happen are usually held in abeyance during combat but flare up with increased intensity upon return to zones of relative safety.

Comment. To call this man a "fear of flying" case thus exposing him to administrative action without further psychiatric evaluation and denying him reassuring supportive treatment and an opportunity to make several supervised training flights was a serious error. Temporary grounding with a recommendation for therapy over a period of time to allow his anxiety to be resolved

might have prevented his loss so that as a previously valuable flier and excellent officer he might have been salvaged. No other course of action should be considered until a period of active treatment, during which the man is helped to understand his reaction and is given the opportunity to readjust and return to efficient flying fails to have the desired effect. At this point the pilot can make his own decision whether to continue or give up flying. As far as has been true in this case, sentimental exhortation or hasty extraordinary measures without a real understanding of the causes of anxiety may stifle in the best motivated men the desire to render good service.

This tactic, used in the Far East, has prevented the loss of flying personnel who have later proved themselves of great value to the Air Force. No punitive administrative action is really indicated in these instances. This is well demonstrated in the following example of an actual severe phobia. Careful appraisal of the underlying factors, made prior to a final decision which could have meant the loss of a pilot, produced excellent results despite the presence of an underlying neurotic potential.

Case 11 Reactivation of earlier phobic reaction. After completing 30 missions and during three consecutive missions performed at night in pitch black weather a 26-year old B 26 pilot developed an overwhelming anxiety which, spreading to activities other than flying, made him so tense that he became completely ineffectual. Both his flight surgeon and his commanding officer were really concerned over his behavior because up to this time he had been an outstanding pilot who never shirked his duties regardless of their difficulty. He had even taken on extra ground duties which left him little free time of his own and had acted as instructor for other pilots in their combat training missions. An attempt was made in some quarters to construe his case as one of fear of flying based on the possibility of underlying disinterest and lack of moral fiber. Despite an attitude which revealed a desire to return to flying this pilot could not force himself to do so. Because of his excellent past record he was referred early for psychiatric evaluation and during this investigation many resentments were found masked behind a superficially calm and conforming attitude. At first because of a personality pattern which could not allow him to verbalize his emotional reactions he was reluctant to talk. It soon became evident however that his reactions to the casual attitude of his superiors in various matters of flying safety were ambivalent. His voluntary ground duties had become so time consuming that he had actually fallen behind in the number of missions flown and it had been suggested that he maintain his missions with another group which would make his departure later than he had expected. At times this change of schedule forced him into idleness because he had to remain on the ground while the pilots of the new group having flown fewer missions needed time to catch up. He had mixed feelings about those who worked with him. He was held in high



Figur 1 Modified Ilbb t h f sp ne fusion. (R pr nt d wlt p na so f m Hen y M. O nd G t E S Sp nal fus by s mp l fied t h c. J B and J Surg 15 622 625 July 1933)

from the tibia of the patient (fig 2) The procedure of fusion of the vertebral bodies was first carried out by Burns⁷ in 1933 for spondylolisthesis Many distinguished surgeons made their contributions to the subject and several modifications were reported notably by Forbes,⁸ Radulesco,⁹ Brown,¹⁰ Kleinberg,¹¹ Ito and associates¹² and Schede¹³ King¹ inserted metal screws across

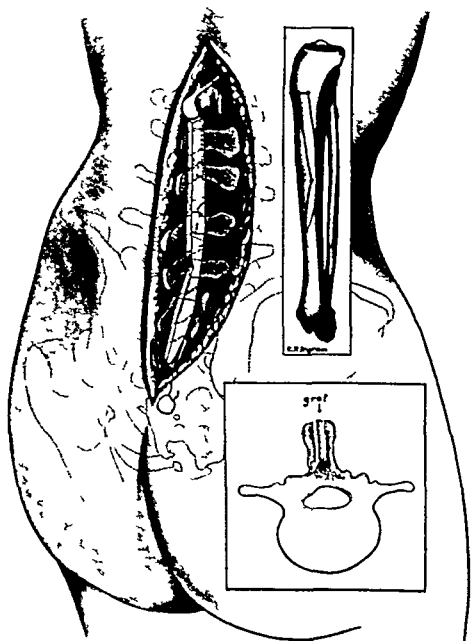


Fig 2 — Albee technique of lumbar fusion (Permitted with permission from Speed J. S. and Smith H. (editors) Campbell's Operative Orthopedic Vol. II 2d edition C. V. Mosby Co. St. Louis Mo 1949 p 969)

the articular facets following removal of the articular cartilage of these joints. The screws were designed to immobilize the joints during healing thereby hastening fusion. In 1945, Bosworth described the clothespin or H graft which consists of a graft with the ends notched out to receive spinous processes at either end of the fusion area. It is placed with the patient in flexion and the spinous processes separated. The patient then being extended it is maintained firmly in position (fig. 3). Iliac strips are used to reinforce the graft. Bosworth reported successful fusion in 89 percent of his cases.

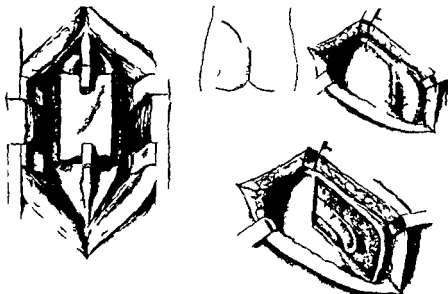


Figure 3 Lumbosacral fusion with clothespin graft and elastic cellulose gauze graft (Reprinted with permission from Bosworth, D. M. Clothespin graft for posterior spondylolisthesis and lumbar defect. Am J Surg 67: 616, June 1945.)

The earliest mention of extrusion of cartilage from an intervertebral space due to trauma was made by Virchow in 1857. Goldthwaite⁷ in 1911 apparently was the first to direct attention to the possible importance of the condition in producing compression of spinal nerve roots within the spinal canal.

SURGICAL TREATMENT

There are three general causes of low back disability which may indicate surgical treatment: (1) trauma either acute rupture of an intervertebral disk or malunion or nonunion of fractures of articular processes, pedicles, and laminae; (2) congenital anomalies such as spondylolysis and spondylolisthesis; increase in the lumbosacral angle; asymmetry of the articular facets of the fifth lumbar and first sacral vertebrae or transitional lumbo-

sacral vertebrae, and (3) degenerative discogenetic syndrome—the degenerative disk with traumatic hypertrophic joints

TRAUMA

Acute rupture of a previously normal rather infrequent event in traumatic dissections of spines reported by instances of rupture of the intervertebral disk, ever, in more than 15 percent of the dissection of the tissues around the lower spine involved all the tissues that go to make up the spine. The trauma that causes a rupture of a vertebral disk in such a manner as to cause various causes, for example, from a fall on his feet or buttocks, or sudden weight. Another common mechanism of trauma is hyperextension of the column, in which the body is supine. A third cause is the location of a spinal segment

In traumatic rupture of an intervertebral fibrosus is torn and the nucleus pulposus is displaced, either anteriorly or laterally, compressing the spinal cord, individual nerve root, depending on the location of sufficient compression of the spinal cord a paraplegia results. If an individual nerve root is compressed, muscle weakness, definite and unequal over the appropriate dermatome, and reflexes of the offending disk is indicated. Whether the time of disk excision is also indicated. Any spinal segment from which a rupture has been surgically removed is no longer mechanically normal. In any operation for removal of a disk, the ligamentum flavum must be removed. If a ligamentum structure which prevents hyperextension. In other instances a surgeon, in exposing some or all of the articular facet with a knife. Other changes also occur. These and the changes in intervertebral disk surgery, will be in connection with the discogenetic syndrome.

TRAUMATIC RUPTURE OF INTERVERTEBRAL DISK

Case 1 A 29 year old man was admitted to the hospital on September 1953 with the complaint of pain down the posterior aspect of his left leg. He had experienced sudden onset of

heavy object four months previously. The symptoms lessened with bed rest but recrudesced with weight bearing and the pain was aggravated by coughing and sneezing. Physical examination revealed tenderness over the lumbosacral joint on the left and paravertebral muscle spasm with lumbar scoliosis to the right. Lumbar spine motion was limited and painful. Straight leg raising was limited to 30° on the left and of the right leg to 60°. Neurologic examination showed absence of the left Achilles reflex and weakness of the triceps surae. There was hypesthesia and hypalgesia of the first sacral dermatome on the left. No abnormal neurologic signs were elicited in the right lower extremity. Roentgenograms of the lumbosacral spine showed no abnormalities. After a month of conservative treatment including bed rest in pelvic traction and local application of heat to the back there was little improvement. On 13 October 1953 a partial Hemilaminectomy of the fifth lumbar vertebra on the left was performed. The annulus fibrosus of the intervertebral disk between the fifth lumbar and first sacral vertebrae was found to be ruptured with the nucleus pulposus protruding through the rent tightly compressing the first sacral nerve root. The intervertebral disk was excised. Spinal fusion was not done. The patient became ambulatory 10 days after operation. One month later he had no sciatic pain and only mild back discomfort. The left Achilles reflex had returned but was hypoactive. The first sacral dermatome hypesthesia was still present. Continuing symptomatic improvement is being shown.

Case 2 A 98 year old man was admitted to the hospital in July 1952 with the complaint of low back pain radiating down the posterior aspect of his right lower extremity to the heel. He had sustained a back injury from heavy lifting in 1948. Following this he had had low back pain with sciatica on the right side. In September 1949 a ruptured intervertebral disk had been excised from the fifth lumbar first sacral level. Except for occasional mild backache his symptoms were relieved until March 1952 when back pain and sciatica on the right side recurred. Examination on admission in July 1952 revealed paravertebral muscle spasm, lumbar scoliosis, tenderness over the fourth and fifth lumbar vertebrae, limited straight leg raising and absence of the Achilles reflex on the right. Extension of the great toe was weak but no sensory loss was observed. Roentgenographic examination of the lumbosacral spine showed narrowing of the intervertebral spaces at two levels between the fourth and fifth lumbar and between the fifth lumbar and first sacral vertebrae (fig 4). Following an unsuccessful trial of conservative treatment a myelogram was made which was interpreted as showing a protruded intervertebral disk between the fourth and fifth lumbar vertebrae on the right. At operation in August 1952

a herniated fourth lumbar disk was found and removed and spinal fusion of the fourth and fifth lumbar and first sacral vertebrae was done. When the patient was last seen in June 1953 he had no back or sciatic pain and clinical and roentgenographic examination showed a solid fusion.



Figure 4 (case 2) Roentgenogram showing narrowing of the fourth and fifth lumbar intervertebral spaces.

Case 3 A 50 year old man was admitted on 9 June 1952 complaining of low back pain radiating down the left lower extremity to the toes. Symptoms began when he lifted a heavy object in September 1951. Examination revealed flattening of the lumbar spine, paravertebral muscle spasm, tenderness over the fourth lumbar vertebra, one-fourth inch atrophy of the left calf, weakness of left great toe extension and hypesthesia of the fifth lumbar dermatome. The deep tendon reflexes were active and equal. Roentgenograms of the lumbosacral spine made on 4 April 1952 when he was first seen as an outpatient, showed no

bone or joint abnormality. A myelogram on 11 June 1952 revealed a filling defect between the fourth and fifth lumbar vertebrae. On 18 June 1952 protruded intervertebral disks were removed from between the fourth and fifth lumbar and fifth lumbar and first sacral vertebrae. Following operation the sciatica subsided but back pain persisted. He was discharged from the hospital on 21 August



Fig 5 (a 3) (A) and (B) Roentgenograms of the lumbar and sacral spine taken 1 month after x-ray of the fourth and fifth lumbar vertebrae showing narrowing of the intervertebral spaces.

1952 and was readmitted on 4 November 1952 because of disabling back pain. Sciatic pain had not recurred. Physical findings were essentially the same as on the previous admission. Roentgenograms of the lumbosacral spine showed narrowing of the fourth and fifth lumbar intervertebral spaces (fig 5). It was concluded that he had traumatic arthritis of the fourth and fifth lumbar and first sacral articular facets resulting from settling of the vertebrae following herniation of the disk material and from surgical removal of the nuclei pulposi at these two levels. On 2 December 1952 spinal fusion of the fourth and fifth lumbar vertebrae to the sacrum was performed. When last seen in April 1953 the patient was wearing a back brace but was ambulatory and comfortable. Roentgenograms at that time showed the fusion process to be proceeding satisfactorily.

FRACTURE INVOLVING ARTICULAR PROCESSES

Case 4 A 35-year old man was admitted to the hospital on 30 April 1953 after sustaining a hyperextension injury of the lower part of his back in an automobile accident. Physical examination revealed tenderness over the fourth and fifth lumbar vertebrae. The patient experienced severe pain on motion of his lumbar spine. Roentgenograms of the lumbosacral spine demonstrated fissure fractures involving the inferior articular processes of the fourth and fifth lumbar vertebrae on the right. A few days later aching pain developed deep in the right thigh. Symptoms persisted after two months of bed rest. He was encouraged to become ambulatory while wearing a back brace. After three months of hospitalization, he was returned to limited duty. When last seen six months after injury, he stated that the pain in his back and right thigh was gradually becoming worse. Lumbar spine motion was considerably limited and painful. It is probable that spinal fusion will eventually be required to relieve his symptoms.

As occurred in this case, traumatic arthritis occasionally results from fractures of articular processes, pedicles, and laminae, and spinal fusion may become necessary.

CONGENITAL ANOMALIES

The second group of patients with low back pain in which spinal fusion may be indicated are those in which there is an unstable lumbosacral area which cannot be adequately controlled by conservative measures. The lumbosacral juncture is the part of the spine most vulnerable to mechanical stress and strain. Two primary factors are responsible for this. First, anomalies of the spine are concentrated particularly in the lumbosacral area of the column. The anomalies occur as a result of evolutionary, developmental, or environmental influences. An evolutionary shortening of the vertebral column at the lumbosacral junction is still in progress. Some of the anomalies result in decreased efficiency of the lumbosacral mechanism. Second, all of the weight and movement of the trunk are transmitted from the mobile spine to the fixed base, the sacrum, through the lumbosacral juncture.

Developmental anomalies in the lumbosacral area which make it more vulnerable to daily stresses and strains are

Spondylolysis and spondylolisthesis Spondylolisthesis is characterized by a defect in the pars interarticularis of the neural arch. If the defect is in the fifth lumbar vertebra, its most frequent location, there is gradual anterior displacement upon the sacrum of the fifth lumbar vertebra and the superincumbent spine. In spondylolysis the defect is present but no displacement has

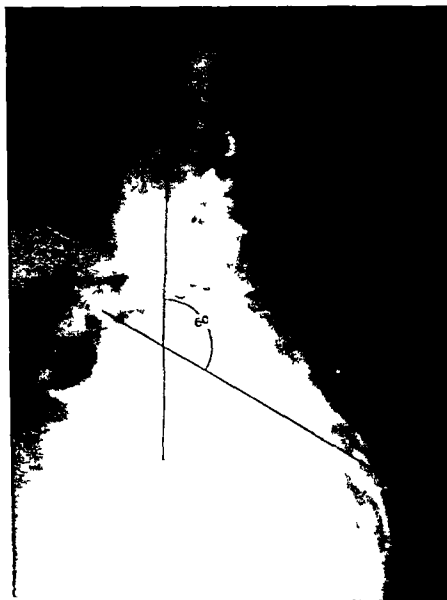
occurred. These anomalies are readily demonstrated in oblique roentgenograms. These are easier to interpret when the neural arch is visualized as a picture of a terrier. The head of the terrier is formed by the pedicle and transverse process, the ears by the superior articular process, the neck by the pars interarticularis, the body by the lamina, and the front and back legs by the two inferior articular processes. When the terrier has a collar on, there is defective union at the pars interarticularis without displacement, and when the terrier is decapitated, there is spondylolisthesis.



Fig. 6 (5). Lat. oblique roentgenogram of the lumbar vertebra showing defective union of the pars interarticularis of the fifth lumbar vertebra with condyloid process.

Case 5. A 30-year-old man was admitted to the hospital on 17 October 1951 with a history of chronically disabling low back pain of one year's duration. The onset of pain was spontane-

ous, and there was no history of back injury. He had experienced associated aching down the posterior aspect of both lower extremities. Conservative treatment, including bracing, had not relieved the symptoms to an acceptable degree. Physical examination was essentially negative. Roentgenographic examination of the lumbosacral spine showed bilateral defects in the pars interarticularis of the fourth and fifth lumbar vertebrae with second degree spondylolisthesis also there was lumbarization of the first sacral segment (fig 6). On 7 November 1951, a modified Hibbs spinal fusion of the third, fourth and fifth lumbar vertebrae to the sacrum was performed. The result is excellent. He



case 6) Roentgenogram showing increased lumbosacral angle which measures 60



Figure 8 (7) (A) and (B) R nitrogenous salt 25 m the flow of the fish is the usual value

performs all duties without difficulty and his activity is in no way restricted. The fusion is clinically and radiographically successful.

Increase in lumbosacral angle The lumbosacral angle normally measures 42.5°. When the angle is increased, the line of body gravity is displaced in front of the lumbosacral joint, thus subjecting it to greater stress and in some instances to early traumatic synovitis and capsulitis of the apophyseal joints.

Case 6 A 27 year old woman was seen in consultation on 13 October 1953 because of nonradiating low back pain of one year's duration. Onset had been insidious and the pain had gradually increased in severity. She had noted that lying in the prone position aggravated the symptoms. Physical examination revealed increased lumbar lordosis. Spine motion was unrestricted, but hyperextension caused pain. Tenderness was elicited over the lumbosacral joint. Roentgenograms showed an increase in the lumbosacral angle, which measured 60° (fig. 7). The patient has been placed on a program of corrective exercises, as advocated by Williams,¹⁹ and postural training. If the lordotic posture is not corrected, traumatic arthritis of the lumbosacral facet joints might result from static mechanical strain, possibly, in later years requiring spinal fusion for relief of symptoms. Most of these patients, however, obtain relief by conservative treatment and spinal fusion is rarely indicated.

Asymmetrical or underdeveloped facets of the fifth lumbar vertebra and first sacral segment transitional lumbosacral vertebra

Case 7 A 35 year old woman was admitted to the hospital on 28 September 1951 with a history of nonradiating low back pain of five years' duration. The symptoms were aggravated by ambulation, and temporarily relieved by bed rest. A program of corrective exercises and postural training had produced only moderate improvement. Physical examination showed accentuated lumbar lordosis. Pain was experienced on hyperextension of the lumbar spine. Roentgenograms revealed a transitional lumbosacral vertebra with asymmetry of the lumbosacral facets. On 4 October 1951 spinal fusion of the transitional vertebra to the sacrum was performed with excellent results. The patient now has no symptoms referable to her back. Roentgenographic examination of the lumbosacral spine in November 1953, 25 months after the operation, revealed solid bony ankylosis (fig. 8).

A constantly increased workload is required of the muscles and ligaments supporting an unstable lumbosacral articulation. When their functional capacity is exceeded by stress, strain, injury, chronic postural overwork, or loss of tone and power

with increasing age symptoms follow. It has been shown that ligamentous structures of the body are the most sensitive to pain.²⁰ Patients in this category have backaches with local signs and symptoms of injury to the vertebral ligamentous structures and with radiating pain deep in character extending down one or both extremities. This radiation because of a notion that pressure or mutation directly involves the nerve roots is often mistakenly called sciatica.

DEGENERATIVE CONDITIONS

Friberg and Hirsch in Sweden reported on a study of 100 lumbar spines taken from postmortem specimens. The material showed that, (1) Disk degeneration acquired pathoanatomic importance when the annulus fibrosus began to rupture. (2) In the lower lumbar disks the ruptures in the annulus were mostly localized to the posterior part of the disk from the center they were directed either sagittally or laterally backward to the intervertebral foramen. (3) Marked degeneration may be present without any radiographic changes. Thus a normal radiograph does not exclude important degeneration in a disk. (4) When the radiograph showed reduced disk space sclerosis or osteophytosis the corresponding disk was severely damaged. (5) In patients with prolapse of the disk the structures had the same pathoanatomic characteristics as they did in patients with simple degeneration. Disk prolapse is a part of the phenomenon of degeneration of the disk.

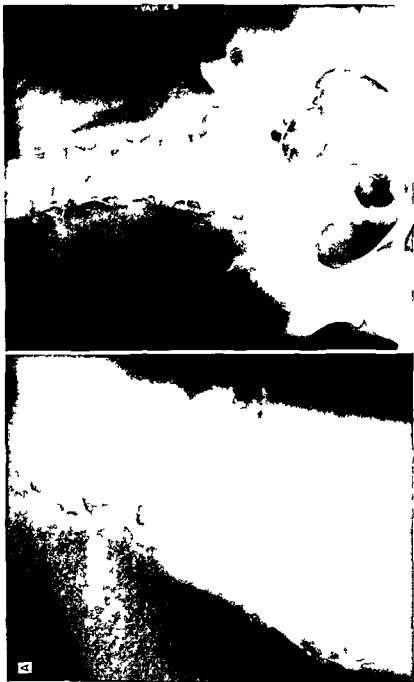
According to Moore when destructive or degenerative changes take place there is relaxation of the supporting ligaments. The intervertebral disk is compressed or loses its turgor and eventually it becomes thinned out. Increased strain is thrown on the apophyseal joints which in turn become narrowed traumatic arthritis finally developing in these joints. The spinous processes approach each other and the interspinous ligament is torn or absorbed. The normal lumbar lordosis is increased. The posterior longitudinal ligament relaxes and bulges toward the spinal canal. It may tear and allow protrusion of the nucleus pulposus. The ligamentum flavum is crushed it becomes fibrosed and thickened and may prolapse forward into the canal. Most important of all the intervertebral foramen is narrowed and the corresponding nerve root at that location may be constricted or it may be compressed by swelling by the nucleus pulposus by the ligamentum flavum by callus or hypertrophic new bone formation about the apophyseal joints.

Treatment of the discogenetic syndrome if conservative measures fail is by spinal fusion. In case there is definite evidence of nerve root compression laminectomy with exploration of the intervertebral disk is done.

Case 8 A 49 year old woman was admitted to the hospital on 25 September 1951 with a history of recurrent episodes of low back pain of 25 years duration Pain had recurred about twice a year, lasting two or three weeks During the year preceding admission, symptoms had been more frequent and severe and pain had radiated into the posterior left thigh Physical examination revealed tenderness over the lumbosacral joint Motion of the joint was painful but not restricted Straight leg raising was not limited and neurologic examination was within normal limits Roentgenographic examination showed marked reduction of the intervertebral disk space between the fifth lumbar and first sacral vertebrae, sclerosis and posterior subluxation of the facets, and contiguous eburnation of the bodies of the fifth lumbar and first sacral vertebrae On 26 September 1951 spinal fusion of the fifth lumbar vertebra to the sacrum was performed The result was excellent The patient now has no significant back pain and enjoys unrestricted activity Roentgenograms of the lumbosacral spine, taken 19 months after operation, showed solid bony fusion (fig 9)

Case 9 A 35-year old man was admitted to the hospital on 7 September 1951 because of severe low back pain radiating into the left lower extremity Symptoms began in 1943 when he was serving with Marine Corps combat units although he remembered no specific back injury Subsequently back pain recurred repeatedly Physical examination revealed tenderness over the lumbosacral joint lumbar scoliosis and limitation of motion, paravertebral muscle spasm, restricted left straight leg raising and diminution of the left knee reflex Roentgenograms of the lumbosacral spine showed reduction of the intervertebral disk spaces between the fourth and fifth lumbar, and the fifth lumbar and first sacral vertebrae There were contiguous eburnation and osteophytosis of the bodies of these vertebrae At operation on 18 September 1951 the first sacral nerve root on the left was found to be wrapped in dense scar tissue flattened in caliber and attached by the scar to the overlying ligamentum flavum There was no protrusion of cartilage from the disk space, which was entered easily as no annulus was present The interspace between the fourth and fifth lumbar vertebrae was also explored, and no disk protrusion was found Spinal fusion of the fourth and fifth lumbar vertebrae to the sacrum was performed Following operation the patient's symptoms were relieved Roentgenograms taken in December 1952 showed sound bony fusion When last seen in October 1953 he was performing full duty as a Marine officer without difficulty

Case 10 A 44-year old woman was admitted on 7 July 1952 because of pain in the lower part of her back, and in her left thigh and leg Her first difficulty dated to an injury in 1939, but



Figur 9 (cas 8) (A) nd (B) R ndg mgt m t k 19 m uh ft t bl g p t bow g c ful bo y
f 10 fth fth lumb-a t by to th crum.

her first definite attacks of sciatica began in 1948. She had had several episodes of severe sciatica, relieved by bed rest in pelvic flexion. There had been interludes of freedom from pain while wearing a back support. Examination on admission showed considerable paravertebral muscle spasm, markedly limited straight leg raising on the left, weakness of great toe extension, hypesthesia of the first sacral dermatome, and absent Achilles reflex on the left. With conservative treatment the abnormal neurologic signs disappeared but back pain and sciatica persisted. Roentgenograms of the lumbosacral spine showed diminution of the interspace between the fifth lumbar and first sacral vertebrae, erosion almost to the point of disappearance of the lumbosacral facets, narrowing of the neural foramina and subluxation of the fifth lumbar vertebra on the sacrum. On 18 September 1952 a spinal fusion of the fifth lumbar vertebra to the sacrum was done, which relieved her symptoms. Roentgenograms taken in July 1953 showed solid bony fusion. At the present time she has no pain in her back or lower extremities.

According to Bradford and Spurling,²⁵ patients with symptoms of herniated nucleus pulposus but with little disability rarely need spinal fusion, while those with severe or long standing disability may well need it. Patients with instability of the lower lumbar articulations, but with no radicular findings and no complete sciatic radiation of pain require fusion alone. In that group of patients with instability of one of the two lower intervertebral disks plus a history of sciatic pain and objective radicular findings the intervertebral disk must be exposed during fusion.

That there has been considerable variance of opinion on this point is apparent from a study of the literature. O'Connell²⁶ reported on a series of 500 operations showing that cure, or at least alleviation of symptoms, was gained by excision and curettage of the disk alone in more than 90 percent of patients. In a series reported by Love and Walsh²⁷ of 100 patients with protruded intervertebral disks on whom operation was performed, it was found neither necessary nor advisable to carry out fusion. Caldwell and Sheppard²⁸ reported on 151 laminectomies performed, 95 of the patients returning for re-examination. The authors concluded that in a high percentage of cases as satisfactory results could be obtained by laminectomy alone as by a combined operation. To them there did not seem to be any criteria for spinal fusion following removal of the protruded nucleus pulposus. James and Nisbet² believed that an increasingly small number of patients with prolapse of an intervertebral disk seem to need spinal fusion in addition to curettage of the disk. Supporting this view, Armstrong²⁹ considers immediate arthrodesis of the spine at the time of disk excision generally undesirable. The

Research Committee of the American Orthopedic Association in an end result study of the treatment of herniated nucleus pulposus by excision with fusion and without fusion found that the number of satisfactory results from combining excision with fusion was almost 10 percent greater and that the best results were found twice as frequently in the patients whose spines had been fused. The conclusion was reached however that when surgical intervention is necessary for simple cases of herniated nucleus pulposus the operation of choice is disk excision only.

On the other hand it is Moore's opinion that every surgical removal of a herniated nucleus pulposus should be followed by immediate spinal fusion. Magnuson and Steindler concur. Barr²² considers this thesis to be tenable. In Scott's series of disk explorations and spinal fusions done over a period of seven years each patient had peripheral signs of nerve root irritation and was relieved by removal of the appropriate spinous process and lamina followed by spinal fusion. In none was prolapse of disk material found at operation. Scott believed that provided sound bony fusion is achieved curettage of the disk is probably an unnecessary procedure.

The mortality rate in simple disk excision and/or spinal fusion is very low. In the series throughout the country the mortality rate has been consistently less than one percent. Based on statistics derived from operations most of which were performed during the period from 1935 to 1945 about 15 percent of spinal fusions were found to be unsuccessful. Smith stated that the results of spinal fusion have been excellent or good in more than 80 percent of the cases. According to Peck complete relief of low back pain can be expected in 70 to 75 percent of patients carefully selected for this operation, 10 to 20 percent will be moderately improved and 10 to 15 percent unimproved. Bosworth reported that of more than 600 spinal fusions done for all causes at New York Orthopedic Hospital during the five year period between 1931 and 1935 one or more pseudarthroses occurred in 14 percent of the cases nearly all of which were subsequently repaired. Of 137 spinal fusions performed by Butternorth⁷ the results obtained were excellent in 22.5 percent good in 34 percent satisfactory in 41 percent and poor in 3.5 percent. Cloward designed an operation in which vertebral body fusion is carried out after the intervertebral disk is removed. Complete cure was recorded in 85 percent of the 267 patients on whom this procedure was done.

It is anticipated that the results of spinal fusion performed during the current 10 years will be even better because of the simplification of the technic by use of banked bone as detailed by Toumey other refinements in technic and lowering of the infection rate by antibiotic therapy when needed.

SUMMARY AND CONCLUSIONS

Mechanical low back disability is of frequent occurrence, and no one corrective procedure applies to all cases. All possible causes must be considered before deciding upon surgical correction. The cause may be trauma, congenital anomalies, or degenerative changes. The pain mechanisms in low back and sciatic neuralgia have been discussed because of a tendency to regard all such manifestations as caused by a simple protrusion of the nucleus pulposus.

Simple removal of the sequestered or extruded nuclear material often results in relief of acute symptoms, and is probably justified in cases of traumatic rupture of the disk occurring in the years before middle life. If fibrous ankylosis is sufficient, relief from pain may be prolonged if pain recurs; then stabilization of the back by arthrodesis may give valuable relief.

In patients with severe antecedent back disability uncontrollable by conservative means, stabilization of the back, with or without nerve root exploration, is indicated.

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PROGRESS OF MEDICINE

Although the history of medicine goes back to the beginning of written speech the e is no part of that five thousand year story which is so exciting and dramatic as that of the past century. Into this period have been crowded more advances in medical science than in all previous recorded history and as the years unfold the pace of progress increases almost in geometrical progression.

—SYDNEY SMITH M D

L t p 461 S pt 5 1953

REACTIONS TO PENICILLIN ADMINISTERED ORALLY FOR MASS PROPHYLAXIS OF STREPTOCOCCAL DISEASE

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DURING the winter and early spring of 1952-1953, crystalline penicillin was administered to basic airmen at this base in an effort to reduce the incidence of streptococcal disease. Two groups received 250,000 units orally twice daily for 10 days, and two groups received an equal amount for only 5 days. This article reports the number of reactions encountered, the treatment, and observations as to the apparent effects of the antibiotic on patients with latent fungus disease.

REVIEW OF THE LITERATURE

There have been many reports on the various aspects of penicillin sensitivity resulting from its administration in all forms. Brown¹ reviewed 308 articles covering the period of 1943 to 1948, and the reader is referred to this paper for a complete review of much of the early work on this vast subject. Keefer and co-workers² reported 69 reactions out of 500 cases, including chills and fever in 12, urticaria in 14, and headache and facial flushing in 10. Lyons³ found urticaria the most common single complication (occurring in 5.7 percent of 209 surgical cases). Duemling summarized the results of penicillin in the treatment of 17,879 naval patients for 65 clinical conditions, including 892 patients with neurosyphilis. Ten percent of the total group had Herxheimer reactions, urticaria, pruritus, or fever. Cormia and co-workers⁴ reported that of 2,000 Army personnel receiving prolonged treatment with penicillin, 0.5 percent had reactions such as (1) urticaria complicated by angioneurotic edema, shock, convulsions, and psychotic depression; (2) serum sickness-like syndrome; (3) acute syncope; (4) miliaria-like eruptions; (5) erythema multiforme eruptions which at times simulated dermatophytosis; (6) erythema nodosum; and (7) epididymitis. Thomas and associates⁵ found that urticaria was the most common reaction (in 2.5 percent of 10,000 patients). It occurred 7 to 12

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days after treatment had started and it persisted for from 4 to 5 days regardless of the continuation or discontinuance of the penicillin. Erythematous or papular eruptions were seen in 25 patients within 48 hours after treatment was instituted and lasted 1 to 3 days. Only 2 patients had a bullous dermatitis. Kern⁷, Goldman, and Kleinfeld reported stomatitis, glossitis, and cheilitis as the result of oral administration of penicillin. Among the many reports of contact dermatitis resulting from handling or local application of penicillin preparations, Goldman and associates reported that of 350 patients treated with penicillin ointment for various cutaneous conditions, 16 had eczematous reactions. The patch test was positive in all but 2 of these, whereas 216 control patients had no positive reactions during a 7-day observation period. When these control patients were retested 2 weeks later, 35 of them had a positive reaction, showing that it was not a primary irritant. Peck and associates skin tested 406 adults and 91 children with penicillin and trichophytin. Of the 246 adults who had never received penicillin, 15 (5.4 percent) reacted spontaneously, but none of the 65 children who had had no penicillin reacted positively. The spontaneous reactions by penicillin sensitivity were three times as frequent among patients with a positive reaction to the trichophytin test.

Anderson² reported one patient who developed purpura associated with transient swelling of the joints and subcutaneous tissue and a toxic nephritis. Farrington and Tamura³ and Derzavits and Bernstein reported single cases of severe exfoliative dermatitis from intramuscular administration of penicillin. Kolb and Gray⁴ reported seven patients who developed peripheral neuritis from 10 to 21 days after the initial intramuscular injection of penicillin. Broadbent and co-workers⁵ also reported four cases of injury to a major peripheral nerve which they believed was due to toxicity and not from mechanical trauma or pressure on the nerve trunk. Mayer and co-workers reviewed the literature for anaphylactoid reactions and reported six cases. All of these patients had received previous penicillin therapy and four of the six had a history of prior penicillin sensitivity. One patient died. Wilensky, Waldbott, Thomson, and Christenson and associates also reported fatal reactions. Lepper and co-workers reported the incidence of allergic reactions in 1,303 patients as follows: 1.2 percent of 595 patients receiving aqueous penicillin intramuscularly, 2.7 percent of those receiving crystalline penicillin in oil and beeswax, and 1.4 percent of 148 receiving procaine penicillin in oil. They found that reactions were more frequent when a penicillin preparation was administered over a longer time and that reactions were higher in those who had previous allergies or had previously been treated with penicillin. Gezon and associates gave 125,000 units of penicillin orally daily

and/or sulfadiazine for prophylaxis against streptococcal and nonspecific respiratory infections to about 1,000 naval recruits. They reported that 0.3 percent of these men had dermal reactions varying in intensity from mild pruritus to urticaria severe enough to require hospitalization. Shulman and co-workers,²⁴ in reporting treatment of penicillin reactions in 13 patients, found that the usual picture was fever, extensive urticaria with erythema, and angioneurotic edema. In nine patients there was a definite history of previous penicillin administration, in the conjunctival sac, intranasally, cutaneously and orally in one patient each, and intramuscularly in the others. The average time elapsed from first administering penicillin until the onset of symptoms was nine days with a range of from one to 14 days. All patients responded rapidly to cortisone given orally or to ACTH given intramuscularly or orally. Samitz and Horvath,²⁵ in reporting on two cases of acute, severe, exudative dermatitis of intertriginous areas, concluded that penicillin "broadened the base" of allergy to other medicaments. Because of an acute exacerbation of a previous area of dermatitis resulting from penicillin sensitivity, they also believed that cutaneous testing (patch or intracutaneous) was more dangerous than useful. Babione and associates²⁶ studied several thousand naval personnel using penicillin orally for prophylaxis of gonorrhea. It was not reported how many received penicillin, but some had many exposures and were given either 100,000 or 250,000 unit tablets, depending on the study taking place at that time. There were 37 reactions, 21 of which occurred after the first tablet and all of which were mild urticaria. White²⁷ also was unable to report the exact number treated because men would repeat their prophylaxis many times, but there were 21 reactions from 23,544 treatments and only one of them was a generalized urticaria. The dose of penicillin was a single 500,000 unit tablet taken orally. The sensitivity rate was about 0.18 percent.

Hopkins and associates²⁸ in examining soldiers at an infantry post by clinical inspection found that 24 percent had typical dermatophytosis and 57 percent were suspected cases. Out of 419 patients examined fungi were demonstrated microscopically and culturally in 27 percent whereas 69 percent had positive microscopic findings but had negative cultures. Ajello and co-workers²⁹ examined 871 men entering military service and found that 522 (59.9 percent) had clinical evidence of *tinea pedis*. This included the following signs in the percentages indicated: intertrigo in 11 percent, maceration, 31 percent, scaling, 95 percent, fissuring, 25 percent, dyshidrosis, 9 percent, eczema, 3 percent, denudation, 3 percent, and hyperhidrosis, 2 percent. Of those who had signs of fungus disease, 148 (28.4 percent) had positive findings, and cultures were positive as follows: *Tricho*

phyton mentagrophytes in 17 (32.1 percent) *Trichophyton rubrum* 28 (52.8 percent) *Epidermophyton floccosum* 5 (9.4 percent) and *Candida albicans* 3 (5.7 percent)

THE PROBLEM

Because of the high incidence of streptococcal disease at this base during the early winter of 1952-1953 it was decided to give oral penicillin to a part of the basic trainees using the rest as controls. Group I consisted of 5,690 men who were given 250,000 units of penicillin twice daily for 10 days (22 through 31 January 1953). Group II consisted of 2,720 men who received the same dose for 5 days (14 through 18 February 1953). Group III numbered 7,619 men and the period of administration was for 5 days (10 through 14 March 1953). Group IV was composed of 17,805 men who received penicillin orally for 10 days (13 through 22 April 1953). All men with acute fungus disease or suspected penicillin reactions were sent to the dermatology section for examination, diagnosis and treatment. Only recruits with a history of previous sensitivity to penicillin were excused from the course given to their group (table 1). There were no repetitions of treatment in groups I, II, or III, but a small percentage of group IV had received penicillin with group I, although the majority were new men having replaced those who had completed basic training. Therefore, about 500 men received penicillin orally twice during this study. Because it is the opinion of many dermatologists that the adverse effects of giving penicillin in the presence of fungus disease have been overemphasized in the past, a preliminary survey of about 3,000 basic airmen undergoing medical processing at the beginning of their training was made. The examination consisted of inspection of the feet, hands and groins of the men to discover evidence of maceration, erythema, cracking, scaling or other clinical evidence of previous or chronic fungus disease. The acute, severe cases having been screened out prior to arrival at this base, very few were seen with other than mild, chronic manifestations of dermatophytosis. Scrapings and cultures were not taken unless there was serious question of diagnosis or if the patient complained of symptoms. Of this group examined, about 60 percent received penicillin orally.

RESULTS

Of the 3,000 airmen examined for clinical evidence of latent dermatophytosis, 16 percent had evidence of mild, chronic or latent dermatophytosis such as erythema, maceration, vesiculation or pigmentation of the groin, erythema, vesiculation, maceration, scaling or fissuring of the interdigital spaces or patchy vesiculation or scaling elsewhere on the foot and/or dermatophytid of the hands. There were 17 patients with symp

TABLE 1 Sensitivity reactions to oral administration of penicillin

Gr p	I	II	III	IV	Total
Number of men treated	5 690	2 720	7 612	17 805	33 827
Number of days penicillin was given	10	5	5	10	
Patients with reaction	34 (0.6%)	7 (0.3%)	8 (0.1%)	41 (0.2%)	90 (0.3%)
Patients used	38 (0.7%)	7 (0.3%)	15 (0.2%)	64 (0.4%)	107 (0.6%)
Unilateral reactions					71
Mild	4	0	2	15	21
Mod. rat.	17	3	5	19	44
Severe	2	2	0	2	6
Serum sickness					29
Mild	1	0	0	5	6
Mod. rat.	7	0	0	13	20
Severe	0	1	1	1	3
Other reactions					21
Contact dermatitis	4 (a)	0	0	1 (b)	5
Funguslike	5 (c)	2 (d)	1 (e)	4 (f)	12
Erythema multiforme	0	0	0		2
Purpuric	0	1	0	0	1
Pyoderma	0	0	1	0	1
Total all reactions					121
Patients receiving penicillin orally	21	4	5	36	66
Patients not receiving penicillin orally	12	2	2	4	20
Patients with pyoderma	14	3	3	27	45
Patients having no pyoderma	15	4	5	12	40
Patients receiving no penicillin orally having no pyoderma	2	1	1	14	18
Patients admitted to hospital	3 (g)	2 (h)	1	15	21 (i)
Patients treated with ACTH	0	1	0	3	4
Patients treated with cortisone	1 (j)	0	0	1	2
Patients treated with ACTH and cortisone	0	1	-	1	2

(a) Two cases of contact dermatitis from handling of tablets

(b) One case of contact dermatitis from handling of tablets

(c) Cultures for fungus negative for five patients

(d) Culture for fungus negative for two patients

(e) Culture for fungus (*Trichophyton gypseum* solid) negative

(f) Fungus culture with negative result suspect due to false dermatophytes

(g) On admission to clinic and received cortisone orally

(h) Both patients received ACTH. One patient received ACTH only previous admission

(i) Two patients receiving penicillin for 25 admissions

TABLE 25. Duty assignments of 115 dental technicians (250,000) to AF units

Duty	R									T	I
	F g yp	D ma phyr d lk	S m k lk	U	C d m	E yth m m l f m	P yr	Purpur			
1	5		2	11	2				20	(30)	
2	2	1	2	3	1				9		
3			2	4	2				8	37	
4				1			1		3		
5	1			2					3		
6	1		2	4					7		
7			2	3					5		
8			2	3					5		
9			5	6					11		
10			2	9					11		
11		1	2	5					8	(42)	
12	1		1	3					5		
13			2	5					7		
14			3	5				1	9	51	

TABLE 2 Sensitivity reactions to penicillin orally administered (250 000 units twice daily) to Air Force recruits--Continued

D yr cti ccured	Reacti n							
	Fungus typ	D rmat phyrid like	Ser m sickn ss like	U r c ria	Co t ct derm titi	Erythema multiform	Pity r ia	Purpura
15				1				1
16				1		1		2
17				1				1
18				2				2
19				1				1
20								0
21								0
22								0
23			1					1
24			1	1				2
Tot l	10	2	29	71	5	2	1	121

toms or in whom there was considerable doubt as to diagnosis of dermatophytosis. Cultures from these revealed three cases of *T mentagrophytes*, one case of *E floccosum* and one of *T rubrum*. The other cultures were negative and the patients were not included in the survey. Of the 20 cultures (one to three tubes each) taken on the patients admitted to the hospital for penicillin sensitivity, only one positive culture was obtained (*T mentagrophytes*). Repeated culture from the webbed spaces of fingers and toes of several of the severe funguslike or dermatophytid like reactions were repeatedly negative (table 1).

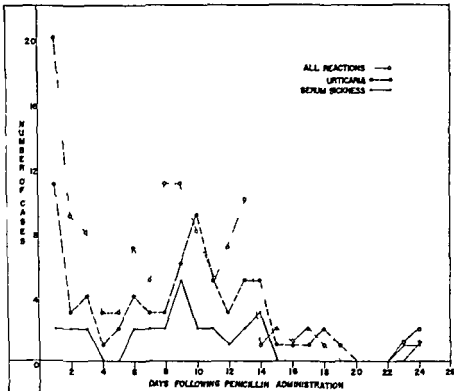


Fig 1 Time of onset of major manifestations of penicillin sensitivity following administration of 250,000 units daily

The number and types of reactions resulting from the oral use of penicillin in the four groups are summarized in table 1.

Table 2 and figure 1 summarize the time each reaction appeared, considering the beginning of therapy as the first day. It will be noted that 30 percent of the reactions occurred in less than 72 hours and that 42 percent occurred in from 9 to 14 days.

Table 3 shows the time lost by each patient. The majority were in the hospital seven days or less, there being only 192 patient days for the whole group.

TREATMENT

Twenty-one patients accounted for 25 admissions to the hospital. Four of these patients were treated with ACTH by slow intravenous infusion, two were given cortisone orally, and two had intravenous injections of ACTH followed by a maintenance dose of cortisone orally (table 1). The dose of ACTH was 20 mg. daily for from three to five days, depending on the rapidity of

TABLE 3 Time lost in hospital as result of severe eczematous reactions after 2.5 mg penicillin orally

Days in hospital	Number of patients by group				Total number of patients from all groups	Total penicillin days
	I	II	III	IV		
2	1	0	0	1		4
3	0	0	0	4	4	12
4	1	0	1	2	4	16
5	0	1	0	1		10
6	0	0	0	1	1	6
7	0	0	0	3	3	21
11	0	0	0	1	1	11
15	0	0	0	1	1	15
18	1	0	0	0	1	18
39	0	1	0	0	1	39
40	0	0	0	1	1	40
Total	3	2	1	15	21	197

* Total days for two admissions

† Total days for four admissions

response. Cortisone was given on a schedule of 300 mg. for the first day, 200 mg. for two days, 100 mg. for from three to five days, depending on response, with a maintenance dose of 75 mg. per day for from five to seven days. The symptoms of all of the other patients with urticaria, serum sickness, or erythema multiforme were controlled by from 50 to 100 mg. of antihistamines (diphenhydramine hydrochloride or tripeleminamine hydrochloride).

four times a day and 25 mg of ephedrine sulfate four times a day for from seven to 10 days. Patients with other reactions were treated symptomatically. The patient who required 40 days hospitalization was the only one admitted for funguslike disease. Roentgen ray therapy (375 r of unfiltered superficial x ray) was used as an adjunct to local therapy of the vesiculodesquamative dermatitis of the fingers of both hands. Repeated cultures of scrapings from the webbed spaces of this patient's feet and hands were negative for fungi. He gave no history of previous fungus disease but previously had received penicillin intramuscularly without reaction.

DISCUSSION

Past experience with injections of penicillin in therapeutic doses has resulted in sensitivity of from 0.3 percent to 16 percent and with penicillin given orally in from 0.3 percent to 0.18 percent. An immediate reaction occurred usually within 48 hours and a delayed reaction most commonly about nine days after administering the penicillin. The principal reactions reported varied from mild pruritus and erythema to serum sickness, urticaria, angioneurotic edema, exfoliative dermatitis and anaphylactoid shock.

It will be noted that the majority of our reactions were mild to moderately severe and that they were fewer in number than usually reported for intramuscularly administered penicillin. It is interesting to note that our rate of 0.3 percent is exactly the same as reported by Gezon for oral penicillin administered to naval recruits. Because both groups were made up of young healthy and physically selected males one might expect fewer reactions, particularly because the total orally given dose of penicillin was relatively low as compared with the therapeutic amount administered intramuscularly for diseases and surgical conditions usually reported. Our results also show an immediate reaction within 24 hours, particularly urticaria and funguslike reaction, and a delayed reaction about nine or 10 days after first receiving penicillin. Urticaria and serum sickness in our experience were much more common than any other reaction and contrary to other reports apparent activation of pre-existing fungus disease did not occur frequently. Peck and associates and Cormia and Lewis have indicated by skin testing children and adults with penicillin and trichophyton that prior dermatophytosis had caused sensitivity to penicillin in many patients in the absence of prior administration of this agent. Schnurman reported on five patients in whom he believed penicillin had activated latent trichophyton infection. If it had been possible to predict in advance and skin test with trichophyton and penicillin the 18 patients in this study who had penicillin reactions

but no history of prior penicillin therapy or dermatophytosis, further information might have been obtained on this point. However, because 16 percent of a sample of 3 000 recruits had apparent clinical evidence of fungus disease and five of 17 had positive cultures, but only 0.3 percent of the total group had penicillin reactions, and only one of these had proved activation of a trichophyton infection, we believe that the dangers of giving penicillin in the presence of active fungus disease have been overemphasized. This bears out our clinical impression that penicillin may be given whenever indicated, even in the presence of proved trichophyton infection (*e. g.* treatment of secondary infection of an acute dermatophytosis where laboratory tests show the predominating organism to be most sensitive to penicillin). In general, treatment of patients who had reactions was not difficult, symptoms in all but eight patients were controlled by antihistamines and ephedrine sulfate for a period of from five to seven days. As reported by Shulman and associates and Hensler and associates,²² ACTH and cortisone readily controlled the reactions not otherwise amenable to the usual measures. We preferred ACTH by slow intravenous infusion to intramuscular administration of ACTH, or to cortisone administered orally or intramuscularly because the dose could be kept relatively much lower, thereby preventing the more common side effects of these hormones.

The question of the number of reactions not seen by a physician in this study was considered. There were undoubtedly cases in which slight erythema or pruritus were not reported, but because of the rigid military control possible with these basic airmen, and because those seen came in small numbers from almost all units, we believe the number missed was very small. There was no way of determining whether in the case of purpura the disease was due to penicillin or to beta hemolytic streptococcus which was isolated from the patient's throat on admission. The patient's laboratory studies revealed no blood abnormalities. The pityriasis rosea may have been a coincidental manifestation also. The two cases of erythema multiforme, however, both started as urticaria and soon became classical examples of this condition, and we believe definitely resulted from the oral penicillin.

SUMMARY AND CONCLUSIONS

Penicillin was given orally to a total of 33 827 airmen in an attempt to reduce the incidence of streptococcal disease: two groups receiving 250 000 units twice daily for 10 days and two groups receiving an equal amount for five days. There were 121 reactions in 90 men, the majority of which were urticaria, serum sickness or a combination of the two.

Five patients had reactions resembling contact dermatitis and three of these were due to handling the penicillin tablets. Twenty-one airmen were hospitalized 16 for from two to seven days. Eight of the hospitalized patients were treated with ACTH or cortisone or both. There were no severe gastrointestinal symptoms and no cases of anaphylactoid shock, convulsions, peripheral neuritis, erythema nodosum, or exfoliative dermatitis.

A preliminary survey of 3 000 basic airmen revealed that 16 percent had clinical evidence of mild chronic dermatophytosis and of these about 60 percent were given penicillin orally. Of 12 men with reactions resembling dermatophytosis or dermatophytid, only one had a positive culture for a dermatophyte (*T mentagrophytes*).

It is concluded that the allergic manifestations resulting from the oral administration of penicillin to healthy young men in the amounts and during the time of this study were fewer than anticipated or usually reported for penicillin administered intramuscularly. The results would tend to indicate that the adverse effects of giving penicillin in the presence of latent dermatophytosis have been overemphasized. This study confirms other reports that penicillin reactions occur in immediate and delayed forms. 30 percent occurred in 72 hours or less and 42 percent occurred in from nine to 14 days inclusive. The majority of reactions were mild or moderately severe and were controlled readily with antihistamines and ephedrine sulfate for a seven to 10-day period. The severe reactions were controlled with ACTH, cortisone, or both.

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A METHOD FOR THE DETERMINATION AND SEPARATION OF PROTEIN IN URINE

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ALL methods commonly used for the determination of protein in urine are dependent on the precipitation of the protein either by chemical agents or by a combination of chemical agents and heat. Some of these like the ring test with nitric acid and the heat-and acetic acid method are of value mainly as screening or qualitative procedures while the sulfosalicylic acid method and the beta aminosulfonic acid method generally are considered to be sufficiently accurate for the semiquantitative estimation of protein in urine for clinical purposes. These accepted methods may precipitate constituents other than protein however and allow confusing discrepancies when comparative tests are run. Furthermore the nature of the recovered protein usually is unsuitable if more detailed studies are desirable.

The method described here is a preliminary report of an extremely simple procedure for the determination and separation of protein in urine. It can be used for preliminary screening as well as for semiquantitative or quantitative purposes.

This method is based on the protein precipitating property of sodium tetrametaphosphate which we recently reported¹ for the separation of protein fractions of various biologic systems such as human blood plasma and serum. This property of sodium tetrametaphosphate is activated when the hydrogen ion concentration is properly adjusted. The addition of the reagent alone to a protein containing specimen of urine produces no visible precipitation but when an acid or an acid salt also is added to acidify the urine to a hydrogen ion concentration of four or lower the native protein in the urine is precipitated. By adjustment of the hydrogen ion concentration in steps fractional precipitation may be obtained. This method is equally effective for dilute and concentrated protein containing specimens. Furthermore as in the

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case of the other biologic systems, no substance in urine but native protein reacts with the tetrametaphosphate

METHODS

To perform a screening or semiquantitative test, 1 ml of urine cleared by filtration or centrifugation, is measured into a small test tube. About 50 mg of the powdered sodium tetrametaphosphate reagent* then is added and the mixture shaken. In the presence of protein, turbidity is visible within a minute or less and precipitation a few minutes later. Because the degree of turbidity and the amount of precipitate are proportional to the amount of protein in the urine, visual approximations are sufficient for screening or semiquantitative purposes, and side-by-side comparisons with permanent standards are unnecessary.

TABLE 1 *Quantitative determination of protein by sodium tetrametaphosphate reagent when varying amounts of human serum albumin were added to pooled normal urine*

Mg of albumin added per 100 ml of urine	Mg of albumin recovered per 100 ml of urine	Mg of albumin added per 100 ml of urine	Mg of albumin recovered per 100 ml of urine
10	9-11	90	89-91
15	15-16	100	98-102
20	19-22	150	147-153
30	28-31	200	199-204
40	39-42	250	246-253
50	50-52	300	296-303
60	58-60	350	345-354
70	68-71	400	396-405
80	79-82	500	495-510

When reading a test, the test tube is held against a dull back ground and viewed by indirect light, so that the slight turbidity and precipitation obtained with concentrations of protein of less than 10 mg per 100 ml may be detected easily. If large amounts of protein are present, the urine may be diluted with water in appropriate proportions, and the dilution factor taken into account in calculations. Even though the concentration of urine is thereby reduced this test demonstrates protein quantitatively over the wide range usually encountered.

*The sodium tetrametaphosphate reagent, containing a balanced proportion of sodium tetrametaphosphate and sodium chloride, was supplied under the trade name Protinur by Diagnostic Aids, 29 Commonwealth Ave., Boston, Mass.

To perform a quantitative test, measured amounts of cleared urine, ranging from 1 to 3 ml, and about 50 mg of the powdered reagent for each 1 ml of urine are placed in a graduated centrifuge tube similar to the 3 ml Kimble No 46815 centrifuge tube. This is graduated from 0 to 0.4 ml in 0.004 subdivisions and from 0.5 ml to 3 ml in 0.1 ml divisions. The tube is agitated until solution occurs, and allowed to stand for a few minutes in order to permit complete precipitation. Then it is centrifuged for 10 minutes at about 2,000 r p m and the amount of precipitate determined. The values obtained in this manner have been comparable with those of sensitive analytic procedures.

Effervescence appears in any urine having an original pH above 7.2. In protein containing urines, precipitation occurs after the effervescence has subsided. Because the appearance of effervescence in urine specimens treated with the sodium tetrametaphosphate reagent signifies alkalinity, this reagent may also be considered an indicator of an alkaline or acid urine depending on whether or not effervescence is observed.

RESULTS

Over 7,500 examinations of urine for protein content have been carried out by this method. By its use protein concentrations as low as 5 to 10 mg per 100 ml urine were regularly detected. Electrophoretic analyses of the precipitate obtained with this procedure indicated that the precipitated protein was composed largely of albumin. Because no substance in urine other than native protein was found to react with the tetrametaphosphate reagent, the reagent appeared to have a specific action for such protein.

In order to test further the specificity of the sodium tetrametaphosphate method, known amounts of human serum albumin were added to samples of normal urine, which were then treated with the reagent. The amount of albumin precipitated, as measured quantitatively, was found to be the amount introduced, within the limits of error (table 1). When known amounts of human serum albumin were added to specimens of urine having varying amounts of protein, the combined amounts were recovered quantitatively (table 2).

Hydrolyzed proteins, peptones, protooses, and amino acids failed to react with the tetrametaphosphate reagent.

SUMMARY

A simple and rapid method for the determination and separation of protein in urine, requiring only 1 ml of cleared urine and 50 mg of a dry sodium tetrametaphosphate reagent is described.

The sodium tetrametaphosphate reagent employed appears to be highly specific for protein and may be used either for screening purposes or for semiquantitative or quantitative measurements

This preliminary study offers a new and accurate approach to the determination and separation of protein in urine

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A CO WORKER SPEAKS OF EHRLICH

Paul Ehrlich was a man not only of rare scientific genius but of a very unusual personality. His waking thoughts and attention were concentrated upon his scientific activities and speculations with a burning intensity. Any visitor if he could be thought to have some kind of contact with such interests was likely to find himself abruptly plunged into a flood of enthusiastic and exclamatory exposition though he could hardly fail to retain some stimulus and inspiration from the immersion. Within his special range Ehrlich's knowledge was profound and comprehensive and his memory prodigious but beyond the sharply drawn limits of that range he made no secret but rather a parade of the astonishing completeness of his ignorance. Anything electrical for example was entirely beyond his ken and he would confess to or boast of his inability to remember the direction of the earth's rotation. Apart from his unremitting concentration on his scientific work his small remainder of interests and activities had a remarkable simplicity.

He seemed to read very little outside his own scientific range. I have heard him speak with enthusiasm indeed of the Sherlock Holmes stories and a portrait of Conan Doyle hung on his study wall but that was because he prided himself on a supposed resemblance between Holmes's detective methods and those of his own researches. His tastes in the fine arts were those of a child and there were many other childlike aspects of his character. He had no trace of the pomposity which men of his eminence in the Germany of those days were apt to display and his freedom from many nominal inhibitions could be endearing or exasperating according to the circumstances. He seemed to be generous and petty, open hearted and secretive, culpably careless of his own interests and fiercely explosively resentful of anything which he felt as an encroachment or even a unfair criticism—all in turn and unpredictably. His character seemed indeed to have a heavy dose of what is commonly called the artistic temperament but without any fault of artistic appreciation.

—SIR HENRY DALE

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USE OF CALCIUM HYDROXIDE AS A PULP CAPPING MATERIAL

A Clinical Study in Young Adults

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THE history of the management of carious teeth with pulps exposed indicates that dentists have long favored pulpotomy.^{1,2} Since 1938 the use of calcium hydroxide as a pulp capping material^{3,4,5} to avoid pulpotomy has been reported. Glass and Zander,³ who demonstrated pulp healing in four weeks using calcium hydroxide noted that absence of symptoms did not necessarily indicate healing had taken place.

In our experience, a high degree of success was obtained following pulp capping with calcium hydroxide. The patients treated were young adults between the ages of 19 and 23 years with an average age of 20.03 years. Because much of the previously reported work had been done on children,⁶ we believed that results in an older age group should be analyzed. The 24 dentists participating in this study selected patients on the basis of the history and clinical appearance of the teeth.

PROCEDURE

The procedure was as follows. When pulp tissue was exposed the tooth was protected by cotton rolls from further contamination by saliva and the remaining caries were carefully removed. After the cavity preparation was completed the pulp was capped with a workable mixture of tap water and calcium hydroxide (fig. 1). Where necessary the excess moisture was dried by gentle application of warm air or by a pledget of cotton without compressing the pulpal tissue. Then a base of oxyphosphate of zinc cement was applied. If time permitted a permanent filling was then placed, otherwise oxyphosphate cement was the only material used for temporary filling, and part of it was left in place when a permanent filling was placed at a subsequent visit. Each tooth so treated was examined roentgenographically and teeth which failed to present a normal appearing alveolar process around the root ends, or showed evidence of periodontoclasia or mechanical failure, were eliminated from the

study The radiologic examinations were done by the same dentist throughout the test The dentist treating the patient recorded the presence or absence of pain previous to the operation the prognosis and the treatment given and evaluated the results

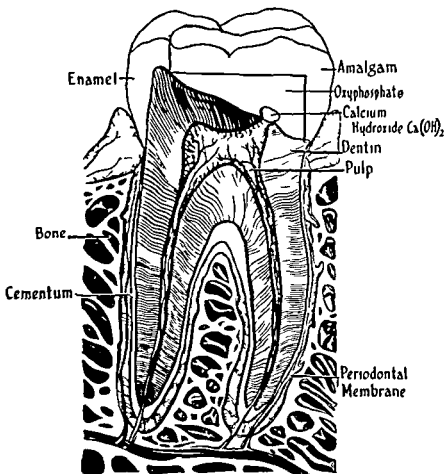


Fig 1 D g m m t k t h

METHOD OF TESTING

Of about 225 teeth treated by this method in four months only 5% could be tested clinically and radiologically in a follow up study Healing of the tooth pulp was considered to have taken place if the patient's reaction to heat and cold stimuli in the treated tooth was the same as in the adjoining teeth of the same tooth group The electric pulp tester was not used because most of the restorations were large in proximity with the gingiva and adjacent to other metallic restorations Radiologically the in

TABLE 1 Postoperative results in anterior teeth

Clinical number	Time (months) between operation and postoperative check	Preoperative pain	Prognosis at operation	Radiographic evidence of dental bridge
1	Failure	Undetermined	Undetermined	Periapical abscess
2	4	Undetermined	Undetermined	Yes
3	4	None	Good	No
4	4	None	Good	No
5	3	None	Good	No
6	2	Undetermined	Undetermined	Yes
7	2	None	Good	Yes
8	3	Undetermined	Poor	No

TABLE 2. Postoperative results.

Cumulative	Tm (months) between operations	Postoperative results	Postoperative results	Postoperative results
9	3	N	G d	Radical
10	3	N	Go d	Y
11	3	N e	Go d	N
12	4	U d t m d	U d e m e d	Y
13	3	N ne	P	N
14	4	N	P	Y
15	3	N	G d	N
16	3	Y	P	Y
17	2	Y	Good	Y
18	4	Y	G d	N
19	3	U d t m d	U d t m e d	N
20	4	Y	G d	N
21	3	Y	P	No
22	2	N	P	N
23	4	N	G d	N
24	4	N	G d	Y
25	4	N	Go d	Y
26	2	N	P	Y

TABLE 2 Postoperative results in *bicuspid* teeth—Continued

Case number	Time (month) between operation and postoperative check	Preoperative pain	Prognosis at operation	Radiographic evidence of dentinal bridge
27	3	None	Good	No
28	4	Undetermined	Undetermined	Yes
29	3	Yes	Good	No
30	3	Undetermined	Undetermined	No
31	1	None	Good	No

volved teeth were examined for evidence of dentinal bridge formation or change in alveolar structure. Teeth which showed a thickening of the lamina dura or evidence of hypercementosis were not considered failures; however, a break in the lamina dura or a widening of the periodontal membrane was considered a retrograde change.

RESULTS

The statistical results of this treatment in 52 teeth with a minimum of a 30 day follow up period are shown in tables 1^o and 3. Several points are not self evident in these tables.

The 30 day minimum period applied only to three teeth. Forty nine treated teeth were examined from 60 to 120 days after the operations were performed. Of the 52 teeth involved, 21 were molars, 23 were bicuspsids, and eight were anterior teeth with single pulp canals. We believe these statistics represent the average number of single canals in relation to the average number of multiple canals encountered in operative dentistry, and from this conclude that the difference between single or multiple canals had no effect on the results of this study. The response to heat and cold was normal in the 50 teeth successfully treated.

Pain, which may suggest some retrograde change within the pulp, was present in 14 teeth prior to treatment. In empirical dentistry this is an indication for tooth extraction, but this was not always true in our patients. The vitality of the tooth type and nature of the hemorrhage, size of the pulpal exposure, and the ability to protect the field from further contamination are more important factors in the prognosis than the history of pain. Twenty five teeth in our patients were treated successfully, although the prognosis was poor in 14 because of pain and undetermined in 11 other teeth for various reasons.

Postoperative roentgenograms, in comparison to preoperative ones, showed a periapical abscess in teeth noted as failures in tables 1 and 3. 20 teeth showed evidence of dentinal bridge formation. It was a disadvantage that we were not able to standardize preoperative and postoperative radiography in relation to the position of the patient, length of exposure, time of development, and temperatures of the chemical solutions. In preparing the statistics it was discovered that a treatment failure (case 1) occurred in an anterior tooth in the same patient who had a successful (case 2) pulp capping. Likewise another patient had a success (case 42) and failure (case 41) of a pulp capping of posterior teeth. Of the 52 teeth receiving Ca(OH) pulp capping, 50 observed were clinically successful.

The principal reasons for choosing the simple method which was employed are

1 This study was intended primarily to test the success of the material in a young adult group. Inclusion of any other material would be unnecessary in the light of previous investigation, and would add to the difficulty in controlling the experiment. Therefore drugs commonly used in sterilizing cavities, as well as zinc oxide and eugenol, were omitted.

2 Some investigators have come to believe that calcium hydroxide inactivates the antibiotic drugs in their metallic salt forms with the exception of oxytetracycline (terramycin).

3 The merit of calcium hydroxide in stimulating repair has been reported. Some investigators believe that the hydrogen concentration of the material causes it to be both bacteriostatic and bacteriocidal. Under the conditions within the dentinal walls, it is possible that the material presents a favorable hydrogen ion concentration for repair which may be more important than in other structures.

4 Oxyphosphate of zinc cement placed immediately over the fresh mixture of calcium hydroxide produces tribasic calcium phosphate which is an integral part of calcified dentin. If the exposed area is overlaid with a large amount of a semihard substance such as fresh zinc oxide and eugenol mixture, the mixture may be compressed into the pulp chamber when the cement base and permanent filling material are applied.

5 In this study a permanent restoration was inserted in most cases immediately following pulp capping, thereby avoiding subsequent mechanical injury due to displaced filling material, etc.

SUMMARY AND CONCLUSION

Of 225 teeth treated with calcium hydroxide as a pulp capping material 52 were available for clinical and radiographic observation for from 30 to 120 days. As an aid in control and evaluation only oxyphosphate of zinc cement was used as a filling or filling base in these teeth and no sterilizing drugs, zinc oxide or eugenol were used in treatment. Of the 52 teeth treated the results in 50 were considered to be clinically successful. Two teeth gave radiographic evidence of a periapical abscess. Although the prognosis was undetermined or poor in 25 teeth the results in all but one were clinically successful. The second failure occurred in a tooth with a good prognosis.

These findings indicate that the use of sterilizing drugs, zinc oxide, and eugenol is not essential in the treatment of exposed

TABLE 3 P t p i It n mol i tb

C umbe	T m (m th) betw P t P t d h k	P cop rau p	Prog p	Rad gr ph f d t l b d g
32	2	N n	Good	Y
33	2	N	Go d	N
34	4	Y	P	Y
35	3	N n	P	Y
36	3	N	P	N
37	3	N	Good	N
38	2	N	Good	Y
39	4	Und m d	U d t rm d	N
40	3	N	P	Y
41	F lur	Y	Good	P p l b
42		U d t rm d	U d t rm d	N
43		Y	P	Y
44	3	Y	P	No
45	2	N ne	P	N
46	4	Y	Good	N
47	4	Y	Good	N
48	3	Y	Go d	N
49	1	N	Go d	N

TABLE 3 *Postoperative results in molar teeth—Continued*

Case number	Time (months) between operation and postoperative check	Preoperative pain	Prognosis at operation	Radiographic evidence of dentinal bridge
50	1	None	Good	No
51	2	Yes	Poor	No
52	2	Undetermined	Undetermined	Yes

pulp and that the use of calcium hydroxide is adequate resulting in rapid healing of pulpal tissue in the young tooth

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D-AMPHETAMINE SULFATE IN OBESE HYPERTENSIVE PATIENT

This study was conducted on 148 obese hypertensive patient to determine the immediate and long range blood pressure effect of orally administered d-amphetamine sulfate and the immediate effect of intravenous administration of the drug on blood pressure. The latter and peripheral circulation. Placebo therapy was used as a control.

The results show that 1 Prolonged effect of oral dextroamphetamine sulfate does not affect the long term blood pressure in obese hypertensive patient. There is a mild transitory immediate increase in blood pressure which occurs similarly with placebos but which is seldom greater than pressure recorded prior to the study.

2 Intravenous dextroamphetamine results in a slight unpredictable rise in blood pressure and a moderate transient peripheral vasoconstriction. There is no relationship between these findings nor between them and the occasional decrease in skin temperature that occurs. There is no effect on heart rate nor are there subjective side effects.

3 Dextroamphetamine consistently reduces the appetite but weight loss does not occur without definite dietary restriction.

—ELLIOTT L. GOODMAN M.D. d
EDMUND L. HOUSEL M.D.
Am. J. nat. fib. M. d. I.S.
p 253 Ma 1954

DIFFERENTIAL DIAGNOSIS OF PSYCHOGENIC HEADACHE

CHARLES K. HOFLING *Captain USAF (MC)*

THE magnitude of the problem of headache has long been recognized and many studies have shown that this condition is the most common of patients' complaints. In a survey cited by Wolff¹ eight percent of the men examined for induction into the armed services during World War II had "frequent severe headaches." Its incidence as one of the presenting complaints of patients seeking medical assistance is even higher.

The problem of headache is also one of extreme complexity. Barton and Yater² differentiated 45 diagnostic entities (not including "less common causes," neck pain, and various psychiatric causes) capable of causing headache. Within recent years the immediate mechanisms in the production of headache³ have been greatly clarified but such factors as the simultaneous operation of more than one mechanism and the nature of their ultimate cause complicate the problem.

The diagnosis and management of patients with headache is of especial significance in the military medical services, because administrative, economic, and morale factors are involved to a greater extent than in civilian practice. An example of this interrelationship was that 50 percent of the men in the armed services during World War II who gave significant demonstration of their unsuitability, complained of headache.⁴ A survey of the incidence of this condition as a presenting complaint of airmen who were outpatients at this base for one month (3,796 patient visits during this period) showed that headache was given 474 times (12 1/2 percent) as one of the presenting complaints and 167 times (4 1/2 percent) as the chief complaint.

This report is confined to those headaches which are "psychogenic" i. e. those having emotional factors of considerable significance as the cause. It also includes certain conditions having etiologically significant somatic factors as well. (The exact proportion of patients with headaches in this psychogenic category could not be determined but the physicians conducting sick call estimated it to be about 80 percent of the total.)

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Despite recent research on the subject it is still not an uncommon practice to begin the differential diagnosis of the complaint of headache with three common concepts of headache organic psychogenic and malingered and in the latter two to end it there These concepts may be defined as follows a headache with demonstrable pathology is organic one without such findings is psychogenic and one involving an element of personal gain is malingered Such an approach is superficial and fallacious involving the possibility of serious errors in treatment administration and research

Before reviewing the differential diagnosis of psychogenic headache an outline of the components of a thorough evaluation of such a patient (in addition to the complete physical examination and indicated laboratory procedures) may be useful

1 History of the present illness (a) exact description of headache as to location quality severity duration variability and concurrent physical and psychologic status (b) frequency and timing of headaches (c) exact statement as to time place circumstances and mode of onset of the first headache (d) careful search for precipitating factors of significance and (e) description of other symptomatology of the present illness noting relationship to the headache

2 Mental status examination

3 Personal history with emphasis on emotional factors

4 Family history noting not merely the presence or absence of the complaint of headache but the type and timing of such headaches and the patient's reaction to them and to the relatives concerned

5 Psychologic studies particularly projective tests

Conditions which often involve the presenting complaint of headache and which have emotional factors of great significance in their cause must include the following entities conversion hysteria anxiety neurosis and anxiety reactions neurasthenia organ neurosis migraine and tension headache hypochondriasis depression schizophrenia malingering combinations of the above and headaches having a primary organic cause but complicated by one of the above

These diagnostic entities will be briefly reviewed with more detailed attention given at the end of this report to the problems of differentiation involved in conversion hysteria organ neurosis and malingering

DIAGNOSTIC ENTITIES

Conversion hysteria There is considerable variation in the nature and frequency of conversion headaches simulating other

disease entities. Frequently the patient's affect will afford a useful lead. He may display the oft-mentioned *belle indifference* toward pain he is describing as very severe. His affect may be one of anxiety rather than suffering, or his expression of suffering may tend to be theatrical. He may appear less ill physically than a patient with migraine or depression. Suggestive evidence would include uncovering an emotionally stressful experience that coincided temporally with the onset of headache in a person whose basic personality structure was hysterical. The decisive element in making the diagnosis, however, is the discovery of a specific symbolic meaning in the symptom.

Anxiety neurosis and anxiety reactions. These terms refer to varieties of the same condition, the former being used when the condition is relatively chronic and deep going, and the latter when it is more acute and superficial. The type of headache involved is very similar to that described for neurasthenia. There is a more or less constant feeling of tension and uneasiness, but in addition anxiety spells characterized by shortness of breath, palpitation, rapid pulse, and an emotion similar to fear but without any rational object occur at intervals.

In patients with uncomplicated cases of neurasthenia and anxiety neurosis the history usually reveals current inadequate discharge of sexual tension. Unlike the hysterical headache, the headache in these conditions has no symbolic meaning, but is a symptom of widespread muscular tension associated with emotional conflict³ and thus is in the same category as backache and constipation which are also frequent complaints in neurasthenia.

Neurasthenia. Patients with neurasthenia often complain of a feeling of pressure on the head and sometimes of an aching in the occipital and nuchal region. Fatigue, irritability, restlessness, impaired efficiency, and other concomitant symptoms of neurosis must be apparent to support the diagnosis of neurasthenia.

Organ neurosis. In some respects the neurasthenic anxiety neurotic group of conditions and the organ neurotic group form a continuum in which at least three fourths of the psychogenic headaches in the above survey fell. "Tension headaches" are border zone conditions, occurring in some patients with a typical anxiety neurosis or neurasthenia, and in others appearing physiologically and psychologically more closely analogous to true migraine. The most common locations of "tension headache" are the occipital region, nape of the neck, and temporal region.

Migraine headache is a good example of an organ neurosis forming a well defined clinical entity. Both specific attacks and

the underlying readiness for such attacks has been shown to be related to emotional factors. Thus the history of a clear cut emotional precipitating element is not *per se* a diagnostic point in favor of hysterical headache as against migraine. The general features of a classical migraine attack are too well known to be repeated. Occasionally a therapeutic trial with a cerebral vasodilator drug in the earliest phase or a cranial vasoconstrictor in later phases may be diagnostically clarifying.

Hypochondriasis This disorder is borderline in extent of personality involvement between neurosis and psychosis often representing an early clinical phase in the development of schizophrenia. Headache may be only one of many complaints. The patient's description of his headache may be rather bizarre yet it is not so important as his attitude toward the complaint. The unswerving stability of the patient's preoccupation with his symptoms is highly characteristic as well as the physician's inability to relieve the symptom (except very transiently) by medication, reassurance or change of regimen. Another valuable diagnostic point is the withdrawal of the patient's emotional investment in persons and objects formerly of interest to him.

Depression When headache is present in depression it is usually dull and generalized. In psychotic depression it is characteristically worse in the morning than in the evening. When organic factors have been eliminated this diurnal variation is the most useful diagnostic characteristic of the headache and has occasionally suggested a correct diagnosis of severe depression when other features have been inconspicuous. This headache does not respond appreciably to drugs other than morphine and benzedrine or their derivatives.

Schizophrenia In this condition the complaint of headache is also important chiefly in that it may be the first lead presented to the physician. The flavor of the patient's complaint and its significance in his total mental economy are very similar to the situation in hypochondriasis but are carried a step further due to further personality disintegration. There is often a very bizarre quality to the complaint of headache in a patient with schizophrenia. He may for example say that his head is exploding or about to explode, that his brains are being dissolved by acid or that they have drained into his testes and been discharged as semen. The complaints may be hallucinatory or delusional or qualified by a half believed "it feels as if".

Malingering This area is of particular significance in the military patients. The complaint of headache by a malingerer is not uncommon and its immediate motivation ranges from trying to avoid kitchen police duty to the desire for separation from service with compensation. As a rule the complaint is advanced more

forcefully than specifically. Malingering frequently appears as an exaggeration of a genuine though mild sensation of headache of any cause. In addition to the elimination of other conditions commensurate with the severity of the alleged headache the diagnosis of malingering depends on the demonstration of a motive plus a certain underlying character structure.

Headaches, on the basis of the simultaneous operation of more than one of the above conditions or of one of these conditions plus organic disease, are quite common. The warning derived from this observation is that the discovery of one causative chain should not eliminate others from consideration.

Probably the most difficult differential diagnoses in the group of psychogenic headaches are those involving conversion hysteria, organ neurosis, and malingering. Hysteria occupies a pivotal position, having major features in common with each of the others. The patient with conversion headache and the one with organ neurotic headache both present somatic complaints having unconscious emotional conflicts as significant causative factors. The patient with conversion headache and the one with malingered headache both present complaints having a specific purpose or meaning.

ABSTRACTS OF CASES

Case 1 A 20 year old airman was referred to the neuropsychiatric clinic from the ear, nose, and throat clinic. His presenting complaint was severe, nearly continuous frontal headache worse on the left, of abrupt onset and of six weeks' duration. The daily variations in intensity were typical of the headache of frontal sinusitis, but clinical examination, laboratory studies, and skull roentgenograms revealed negative findings.

Past history revealed that the patient's father, a stern and forbidding figure, suffered from sinusitis attended by left frontal headache. On the evening preceding the onset of the headache the airman had had a severe argument with his father concerning the airman's misconduct with a woman. Although the father had been equally unrestrained in his youth, he demanded totally different behavior from his son. Since the argument the patient had not seen his friend, saying that he felt too ill to enjoy going out.

Case 2 An 18-year old airman was referred from sick call with the complaint of headaches, each of several hours' duration which had occurred several times a week during the preceding month. The headache was localized in the occipital region. The only positive physical finding was a moderate increase in tone of the posterior neck muscles.

Past history revealed that the period of one month coincided with the time during which the airman had been attending a tech-

nical school. The patient was doing passing work but with considerable difficulty. He intended to make the best of things but did not enjoy the work, resented the assignment and had both anxious and hostile feelings toward certain of his instructors (of which he was only partially aware). The patient had had similar feelings toward a civilian employer and his father but had handled these situations by changing jobs and avoiding much contact with his father.

Case 3. A 20 year old airman also attending a technical school was referred to the neuropsychiatric clinic with the complaint of continuous generalized headache of increasing severity and of 10 days duration which he described as terrific. All physical and laboratory findings (including electroencephalographic, spinal fluid and roentgenographic studies) were negative.

Psychologic tests revealed a pattern typical for psychopathic personality. Prior to the patient's first complaint of headache he had attempted to obtain a hardship discharge which had been denied on the basis of insufficient and somewhat fraudulent grounds.

The clinical diagnoses of these patients were conversion hysteria, organ neurosis and malingering respectively. In case 1 the specific meaning of the symptom was "I want to be like my father, taking what I want from women but I am afraid to do this because of his anger." Case 2 also displayed emotional conflicts but here the symptom had no specific meaning in the above sense. It was based on chronic muscular tension which derived from chronic emotional conflicts but it did not express or partially solve these conflicts as did the hysterical headache.

In case 3 the presenting complaint had a purposeful meaning, namely "I want to get out of the service" and in this respect resembled the complaint of the patient with conversion headache. A major difference is that the hysterical patient used the psychologic mechanism of *repression* whereas the malingerer did not. The meaning of the symptoms in the hysterical patient was unconscious whereas that of the malingerer was conscious. As a corollary the hysterical patient unlike the malingerer actually experiences pain.

Aside from the scientific satisfaction of making an accurate diagnosis there are numerous implications both for medical treatment and administrative handling inherent in such differentiations. Many of the following mistakes can be avoided: (1) The physicians will not conclude that a symptom is malingered merely because he can see a purpose behind it. (2) He will not waste time making symbolic interpretations to a patient with an organ neurosis in an attempt to effect a quick remission of symp-

toms (3) He will not lightly dismiss as "psychogenic" a headache which might be the first or foreground symptom of an underlying malignant personality disorder such as hypochondriasis, depression, or schizophrenia (4) He will not embark on a long trial of medications or of intensive psychotherapy in a neurasthenic without first testing the result of relatively simple measures

In addition, an awareness of the complexity of the problem of psychogenic headache will render the physician less confused, discouraged and thwarted in his therapeutic efforts. The following case offers an example of this complexity and its management.

Case 4 This patient was an attractive, strong minded, 41 year old woman, referred to the neuropsychiatric service from the dependent's clinic. Her chief complaint was of severe right hemi-crania, preceded by transient visual difficulties, lasting from six to 12 hours, and usually relieved only by sleep. The attacks averaged two per week and the duration of the illness was about 12 years. The patient had not previously consented to a thorough medical evaluation.

The clinical picture resembled that of migraine and the patient was given dihydroergotamine methanesulfonate (dihydroergotamine (D H E 45)) with prompt but somewhat unexpected results. In about one third of the headaches experienced, the severity was drastically reduced. The patient could not predict which of the headaches would respond to the medication.

The original psychiatric evaluation had indicated a fairly severe personality disturbance related to an unhappy early relationship with a coldly intellectual mother, also afflicted with headaches, an ambivalent relationship with a somewhat seductive father and strong feelings of unsuccessful rivalry with an older and a younger sister. It was now suspected that the remaining headaches simulating the migrainous ones, were of an hysterical nature. A period of expressive psychotherapy was instituted having the limited goal of alleviation of the distressing symptoms. This result was largely achieved, and it was also found that the incidence of the migrainous headaches was reduced.

Any attempt to relieve these symptoms by medication or psychotherapy alone unless very intensive and prolonged, would have failed.

DISCUSSION

The complexity of this problem of headache in general and of headache related to extracerebral factors is particularly stressed,

with especial reference to the situation in military medical practice. Frequently diagnostic efforts stop short of a clear understanding of the nature of the headache with only a differentiation into three main categories—organic, psychogenic and malingered—with no further differentiation except in the first type.

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DIAGNOSIS OF BARBITURISM

The most extensive experimental knowledge about barbituric intoxication is gathered in psychiatric hospitals where patients have been systematically subjected to prolonged barbital sleep in the so-called hibernation cure. In private practice supervision of symptoms is more difficult because patients who are addicted to barbiturates do not go to their physician to be cured but only to get a new prescription when the drug store refuses further requests. Only when there is a complicating symptom do they ask for treatment often without mentioning their habit.

The diagnosis of barbiturism is simple when the patient gives an adequate history. However, he often denies habitual use of sedatives and refuses clinical investigation. In the hospital special chemical methods are available to show barbiturates in blood and other body fluids. When the patient is in coma this is the only dependable method of diagnosis. Twenty-five percent of all acute poisonings are barbiturate poisoning.

—JOOST A. M. MEERLOO, M.D.

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SELF INFLICTED GUNSHOT WOUNDS TO AVOID COMBAT

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THROUGHOUT the history of military medicine the problem of nonsuicidal, self inflicted wounds has continued to concern those with the mission of maintaining the fighting strength of a combat command.^{1, 2} During the Korean conflict we were again faced with this problem. The situation at this hospital appeared to offer an opportunity to study this problem with the view of determining, if possible, the type of personality and the circumstances that lead to such self mutilation.

In our opinion, all the self inflicted wounds reported here were caused in an effort to avoid combat duty, and were without suicidal intent.

CLINICAL MATERIAL

The population studied included an experimental group of 75 patients and a control group of 25 patients. The control group had been treated for minor enemy inflicted gunshot wounds of the extremities. Because most of the men in both groups were wounded in the foot or hand, the types of injury and the medical treatment received were comparable. The age range of the test group was from 17 to 38 years with an average age of 21.6 years, while the age of members of the control group ranged from 18 to 28 years with an average age of 20.7 years. Most of the men had the rank of private or private first class; few, however, were corporals or men with higher enlisted ranks. There were no officers in either group.

PROCEDURE

The psychiatric team approach was used in the study. Patients with the psychiatrist, the clinical psychologist, the psychiatric social worker participating. The psychiatric evaluation included determining the patient's mental status, feelings about the self inflicted wound immediately after

immediately after the injury and his present feelings. An attempt was also made to determine whether or not his motivation for further duty was good, indifferent, or poor.

The psychologic examination was made to determine the intellectual levels and personality patterns of the patients. The Wechsler Bellevue intelligence scale and the Rorschach test were administered to both groups. The psychiatric social history included detailed information of the soldier's service history and status, preservice background, past medical history, and the circumstances existing at the time of the injury.

OBSERVATIONS

There was not sufficient difference between the psychiatric social history of the self-inflicted wound group and the control group to justify a prediction as to what type of person is more subject to self-mutilation. The racial factor did not appear to be of importance, although definite conclusions were not possible because the exact proportion of Negro to white troops in the respective combat units was not known. The greater number of patients with self-inflicted wounds (73 percent) were in non-combat areas at the time of injury. Twenty-two self-inflicted wounds were considered to be in line of duty, a factor which was undetermined in the remainder of the cases. The self-inflicted wound group appeared to be composed of men who had spent a comparatively long time in Korean combat, but a relatively short time in total service. 50 of them had over 31 days of combat and 38 had over 61 days of combat, whereas 53 had less than three years of service. The majority of patients in both groups had less than six months' overseas service on their current tour of duty. Previous combat service in World War II did not seem to be a factor of importance in either group.

In the self-inflicted wound group 62 percent of the injury sites were on the left side, predominantly in the left foot and left hand. The explanations of the right-handed patients who injured themselves on the right side of the body appeared more plausible, and in the majority of instances their injuries were more severe. It appeared that the possibility of the wounding being truly accidental was greater when right-handed persons wounded themselves on the right side of their body than when they injured the left side. Sixteen patients (21 percent) had thoughts referable to their homes and families shortly before their accident. 35 (46 percent) shot themselves in the presence of others.

The men of both groups had an average level of intelligence, but the full scale intelligence quotient of the enemy-inflicted wound group was significantly higher than that of the self-inflicted wound group. The Wechsler Bellevue pattern suggested tend

encies toward instability in the self inflicted wound group. The Rorschach test showed many similarities between the two groups, possibly because all the men were feeling elated about leaving Korea. Patients with self inflicted wounds, however, appeared to have a constitutional psychoneurotic personality of the hysterical type. Traits of emotional lability also were more pronounced in this group than in the control group.

Our findings bear a relation to the work of other investigators on "accident proneness" and suggest that unconscious dynamic urges, such as occur in hysterical amnesia, motivated these men. These urges were probably related to the "accidental act" which resulted in the self inflicted wound.

Primarily, the psychiatric evaluation revealed that, in spite of the extensive information obtained in this study, it was not possible to predict what type of person is apt to shoot himself. None of the 75 patients in the test group, when first seen, appeared to have a psychiatric condition which required either hospital or outpatient treatment. Eight of the 75 were sufficiently unstable to justify recommendation of a three month waiver for combat duty. Of these, seven had character and personality disorders, and the other had anxiety which justified reprofiling. Two of the 25 in the control group showed psychiatric findings sufficient for the recommendation of a three month waiver for combat, but they did not need psychiatric treatment.

The lack of clinically observable anxiety in the test group may suggest a psychoneurotic constitutional make up of the hysterical type as indicated in the psychologic findings, this, however, is conjectural, because the findings in the control group were not remarkably different. On evacuation from the combat front the lack of anxiety is common to most wounded patients. The control group was not studied concurrently with the self inflicted wound group, and was not necessarily made up of men from the same units. These are two important factors that may have influenced our findings. Guilt feelings were elicited in about 30 percent of the patients with self inflicted wounds, but not in the controls. Members of the self inflicted wound group, unlike those of the control group showed some consciously expressed motivation for return to duty, preferably with their former units. However, the nature of the injury made it obvious both to patient and physician that further immediate full combat duty was out of the question.

CONCLUSIONS AND RECOMMENDATIONS

Factors other than those evaluated in this study apparently must be included in any future investigation of this type before tangible, helpful conclusions can be made regarding the type

of person or the set of circumstances leading to self mutilation. The psychodynamic significance of self inflicted wounds in the combat setting should be further studied. Such a study could better be made at the combat level where such factors as motivation, group identification, leadership, and morale can be evaluated more adequately. Controls from identical units at the combat level should be studied concurrently. Whether or not a self inflicted wound claimed to be accidental occurred in the line of duty should be determined immediately and by appropriately assigned personnel in the concerned patient's own organization.

SUMMARY

In a study of an experimental group of 75 patients with self inflicted gunshot wounds and a control group of 95 patients with enemy inflicted gunshot wounds it was not possible to predict the type of person or the set of circumstances that lead to such self mutilation. Certain pertinent associations relative to self inflicted gunshot wounds were noted: (1) 73 percent occurred in noncombat areas; (2) 62 percent of the injury sites were on the left side of the body, however those right-handed persons who injured themselves on the right side of the body appeared to have more serious injuries and gave a more plausible explanation to substantiate their claim of an accident; (3) combat service in World War II did not seem to be a significant factor; (4) none of the patients were psychotic or in need of psychiatric treatment when seen; and (5) guilt feelings were elicited in about 50 percent of the patients with self inflicted wounds but in none of the controls.

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THE REJECTED MANUSCRIPT

No manuscript ever rejected without good cause and a rejected paper if published would indeed enhance the author's reputation. The immediate reaction to a rejection is naturally a feeling of surprise, disappointment or concern, but this will soon pass off when it is remembered that the rejected letter is the bet guardian of an author's good name.

— RAYMOND WHITEHEAD, M. D.
L. I. p. 477, Sept. 5, 1953

LEONARD WOOD, A GALLANT MAN

CHARLES H. BRADFORD, M.D.

IN 1884, Leonard Wood was launched on a career of greatness by being fired. He was an intern at the Boston City Hospital at the time. Regulations forbade house doctors from performing even minor operations without formal permission, but Wood disregarded the formality in a case of a simple skin graft. The superintendent ordered his dismissal, and although the visiting surgeons submitted a written protest, with high commendation of Wood, his punishment was approved by the trustees. From his office, the superintendent watched Wood walk out of the institution, and remarked, "There goes a young man who will never come to any good."¹ The incident was typical of Wood's whole career. The only authority he ever thought he really needed was to be right.

Wood entered practice, succeeded in a small way, yearned for adventure in a large way, entered the Army as a contract surgeon and, on request for active service, was sent to Arizona, where the most strenuous and the last of the great Indian campaigns was about to begin. For years the Apaches, under Geronimo, had defied the United States Army, pillaged the countryside and murdered and tortured their victims. Over 800 ranchers had been killed. Wood joined Captain Lawton, of the Fourth Cavalry, and set out to track down the Indians across their native mountains and deserts until sheer exhaustion forced them to capitulate. In the 20-month campaign that followed, he became known as "one of the few men who could ride, run, or walk down an Apache."² When line officers gave out, Wood substituted for them. Geronimo finally surrendered in 1887. Wood was awarded the Congressional Medal of Honor.

After the campaign, he became one of the very successful practitioners in the city of Washington, if success may be measured by the character of a doctor's clientele. Besides cabinet officers and prominent officials, two Presidents of the United States adopted him as their family doctor—Cleveland and McKinley. Wood made the acquaintance of a new, young friend, Theodore

From Boston University School of Medicine
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Roosevelt Together they forsook the impending war with Spain and they planned to be in it. Their opportunity came when Congress authorized a new regiment the First Volunteer Cavalry soon known as the Rough Riders Wood was assigned to the colonelcy His old frontier comrades, ranchers and cowboys flocked to serve under him Roosevelt as lieutenant colonel and second in command attracted adventure seeking college boys from the East in later years O Henry described the regiment as composed of the aristocracy of the wild men of the west and the wild men of the aristocracy of the east "



This photograph was made in 1886 when Wood, a frontiersman, was on a detail fighting with the First Cavalry Regiment at Fort Huachuca. At the following year when General Wood led the Army to the surrender of the Spanish in the Congress on the Island of Cuba.

Wood achieved an unbelievable record for speed in organizing this regiment. He recruited the men, equipped them, drilled them, transported them to Cuba and led them with brilliant success in combat at Las Guasimas—all in the space of 47 days.

Military victory was one of the least significant aspects of the Cuban campaign. The real glory grew from administrative triumphs. This was Wood's greatest achievement. After hostilities ceased, President McKinley appointed him governor general of the island. The job looked impossible. Wood set about to clean the cities. He paved the roads and rebuilt and extended the railroads. He developed a national system of public education. He

He used local self-government established a military council, organized law courts and arranged a constitutional convention. He resurrected and reorganized the economy and reduced the ravages of disease to a reasonable minimum. All this was done so effectively that within four years a new Cuba had been created and was given back to its native population as an independent country. The young man who would never come to any good was not yet 43.

As governor, Wood played a leading part in the work of the Yellow Fever Commission. He had urged the appointment of a board of experts to study the disease and when Walter Reed



Promoted from a captain in the Medical Department to colonel of the First U S Volunteer Regiment on 8 May 1898 Wood recruited the famous Rough Riders of the Spanish-American War in San Antonio where he was photographed with his deputy Lt Col Theodore Roosevelt left who had signed as Assistant Secretary of the Navy to serve under him. When Wood was advanced to brigadier general in July of the same year Roosevelt was promoted to colonel and given command of the regiment.

and his heroic group were sent to Cuba in response to this appeal Wood obtained the funds to prosecute their researches. When they reached the point where human experimentation became essential for a final proof, it seemed certain that officials in Washington would withhold permission, but Wood never asked for it. With scrupulous care he laid down the conditions for volunteering, and then authorized the experiments on his own responsibility. Dr Rixey, a well known Army surgeon, wrote: "When history has forgotten General Wood the soldier, and for

ernor Wood the administrator it will still remember Dr Wood the surgeon who conquered yellow fever

In 1902 by invitation of the Kaiser Wood attended maneuvers of the German Army and there he formed the conviction that a world war was inevitable He started even then to preach preparedness but could do little about it Instead he campaigned vigorously in the Philippines and established peace among a fiercely hostile population In 1910 President Taft made him chief of staff Still aiming at preparedness Wood attempted to renovate the entire military establishment He closed obsolescent Indian forts and brought the Army east for battle maneuvers he revitalized officers promotions started courses for training civilians and reviewed the *Manual of Courts Martial* He introduced new weapons such as the hand grenade and the shot gun and later the standard carbine and the Lewis machine gun he revived bayonet drill which had been neglected Only six years after the flight at Kitty Hawk he insisted on an aircraft department for the Army Sooner or later he said the aeroplane will be the greatest factor of the century in world affairs " Slowly he had molded the framework of an up-to-date army

No man can make a life long policy of progress and reform without arousing bitter opposition Wood had become explosively controversial as Governor of Cuba and so he remained The formidable soundness of his conduct repelled critical onslaughts behind this he received staunch support from three presidents As the war that Wood had predicted drew near Wilson's pacifist administration assumed power and Wood's influence ended He was transferred to a subordinate departmental command but even here he urged preparedness until it became a byword At Plattsburg he inaugurated extremely successful officers training camps but he was officially reprimanded for his zeal He submitted a basic selective service plan which the administration grudgingly accepted—but it refused to accept Wood Deprived of the top command he was offered a humiliating choice of training assignments In the face of spiteful jealousy he showed some of his finest traits of character "I am a soldier" he said "and go where I am sent" His superlative work in training the 84th Division in Kansas was rewarded by his being relieved of command when the troops embarked to win battle honors overseas Leonard Wood but they won't let him the papers commented

In 1920 the public wanted Wood for the presidency—at least he won and held a large lead at the Republican convention over his nearest rival Governor Lowden However a coalition of political enemies succeeded in blocking him and Harding was nominated Wood returned to the Philippines as governor and he

again displayed his remarkable powers of endurance at years of far sighted air construction and other work.

Throughout this period and a few years later carried a physical handicap that would be a permanent one. In 1902 his head struck a crossbar and a permanent shock developed



At a military review of 2000 U S Army cavalry troops in Washington D C on 13 October 1913 General Wood then Chief of Staff of the Army stands between President Wilson and Secretary of the Navy Joseph Daniels. At the left is Secretary of War Lull and on the right is Franklin D Roosevelt. The man on the extreme right is Franklin D Roosevelt. He was a member of the staff of the Secretary of the Navy on 17 March of that year.

By 1908 this caused spasms of his left leg and occasional convulsive seizures. Both Wood Mitchell and Cushing missed the diagnosis. An inadequate operation was performed by a Boston surgeon in a hospital in 1908. Later, Cushing successfully corrected the tumor in 1910.

resulted for a number of years but gradually the tumor recurred. Wood refused to yield time for further treatment until he was almost completely disabled in 1907. Cushing, canceled a vacation



L. onard W. d. u. a. the only m. d. cal. f. f. c. e. i. b. tory. t. b. com. Ch. f. f. St. ff. f. th. U. ited St. t. Army. H. ret. d. i. 1921 to a. cept. a. app. i. t. me. t. Go. v. nor. Gen. l. f. th. Philipp. l. l. ds. The. gre. t. port. it. pa. t. J. hn. Sargent. bel. ed. that. Wood. f. ce. wa. on. of. th. f. st. A. glo-Saxon. typ. nd. th. ph. t. ge. ph. e. ls. m. y. f. th. qual. t. hi. b. ind. d. h. m. t. a. h. Wood. t. t. for. h. m. At. th. tim. S. ge. t. rui. we. b. g. ght. by. pe. pl. f. p. t. on. nd. ue. lth. in. ll. p. t. f. th. world.

in Europe to operate again. This time the tumor had reached the size of a lemon and though it was successfully removed by an operation lasting eight hours, postoperative hemorrhage developed in the ventricles. "So ended the life of a gallant man," Cushing regretfully commented, believing that a two-stage operation might have succeeded.

The best summary of Wood's career is provided by his own comments when a staff officer, Major Eric Wood,² asked him the rules of his life. He replied:

Always volunteer no matter how dangerous or unpromising the task. Once you have volunteered, never stop fighting. Do things and don't talk about them. During the process you are likely to discover opportunity eventually you can win through to a success and then you will have the pleasure of hearing un-enterprising men, who would never take a chance allude to your achievements as due solely to luck and influence.

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MEDICAL WRITING FOR PUBLICATION

If we are going to write for publication in medical journals we must face the fact that writing is hard work and full of frustrations. Probably the hardest job of all is to get started. For example I have been thinking of working up a paper on the general management of several hundred maternity cases in a small town clinic—discussing the various ways of handling anesthesia prolonged labor induction of labor reasons for referral to hospitals for surgery dangers of breech deliveries and other factors. I am discouraged at the amount of work required to do this and I am worried by the prospect of disappointment if my efforts are rejected. But I am going to start writing that paper right now. If I keep on thinking about the work and worrying about the possibility of disappointment I'll never get started. I believe that I have something good to write about. I am going to try to write well enough that my article will be accepted. If I fail then I'll try again.

—FDW I T ARNOLD Jr M D
in GP

P 33 Apr 19 4

SELECTION OF MARINE CORPS PLATOON LEADERS

WALTER L. WILKINS *Ph D*

AN operational definition of hazardous duty in the armed services might be obtained by simple reference to the types of duty for which extra pay or other incentive is allowed such as those defined in Army Regulations 35 1000 (flying) 1210 (diving) 1240 (glider) 1050 (parachute) 1060 (underwater demolition) or 1070 (combat duty pay defined geographically) or in the pertinent naval regulations referring to comparable duties

Hazardous duty might be defined also by examination of the physiologic stress in certain duties as illustrated in the study by Davis and associates or by examination of the psychiatric effects of hazard as illustrated in the studies of survivors of ship sinkings or aircraft downings Still another definition would consider the stresses presented by the climatic environment which create problems in personnel selection for arctic or tropical duty¹ Another operational approach would relate casualty rates of various types of military duty using the rates as measures of the probability of disablement in the different situations

It remains a question however whether any definition of hazardous duty is psychologically meaningful at present At least we do not have as yet independent identification of psychologic characteristics which are involved in all situations defined as hazardous

For especially arduous or hazardous duty factors in determining personnel requirements such as physical characteristics intelligence special aptitudes or abilities and special background or personality factors have been considered separately The physical characteristics are well illustrated by the general stamina and specific swimming capabilities required for underwater demolition team members or by the physical ability to stand deprivations or stresses within certain limits as in air or

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Cl l f (h 95 r 1953

submarine crew members. The factors of intelligence relevant to combat efficiency are not yet spelled out. It may well be that fear is unrelated to any of the measured aspects of intelligence, yet efficiency in stressful situations should certainly be related to mobilizable intelligent response. Personality factors crucial to success in some sorts of military operations are instanced in the studies of the various keys for scoring the Air Forces Biographical Inventory. The unique skills significant in leadership of hazardous operations have been commented on by Haggard⁴ and Edgerton and associates.⁵

But all of these characteristics, some more and some less presently amenable to reliable measurement, depend upon the special operational requirements of the task involved. It seems clear that there are certain characteristics which would be desirable in any sort of hazardous duty or indeed in any sort of service life. The military services seem to want men who are sturdy, who learn quickly and permanently, and who are cheerful and ingroup minded. Analysis, however, of the special requirements for underwater living and fighting, of polar or desert operation, or of mine warfare should reveal minimal physical, intellectual, social and even character standards which are necessary. It is obvious that such special and detailed analysis has been most advanced and fruitful, and has been carried out with the greatest awareness of the necessity for validation procedures in the air and submarine services. Recent research however has focused attention on the very real problems involved in ground forces actions.⁶

Of the armed services the Marine Corps has been most effective in maintaining the point of view that every member of the organization no matter what the assignment should have a minimal number of basic fighting skills which he can perform in an efficient manner. Whether the duty involves garrisoning a small island for long, deadly periods of time, or being committed to severe and conclusive action of a shorter but even more deadly sort every marine on the basis of his initial training, is presumed to be able to fight to handle his weapons effectively, and to have the necessary spirit and morale. This by no means implies that every marine will see desperate combat; it only implies that he should be able to handle himself adequately in such combat.

This article considers some features of a research program with the purpose of identifying some characteristics possibly typifying Marine Corps platoon leaders, especially those chosen from enlisted ranks for commissioning and selected for their probable aptitude for effective leadership of infantry units in combat. I shall point out some blind alleys which looked good

at one time but shall also try to emphasize what few relationships I believe we can rely on

Marine Corps second lieutenants receive their commissions from various sources such as the U S Naval Academy the Naval Reserve Officers Training Course platoon leaders classes and officer candidate school classes which are composed of college students and college graduates who are not members of ROTC But the Corps has selected for commissioning upon a meritorious basis many enlisted men In 1949 a systematic program was set up by the Marine Corps to identify and commission the best qualified enlisted men Provisional validation of aspects of the selection process has been reported to this division and to military men responsible for personnel decisions

For consideration at the Officer Candidate Screening Course Marine Corps Schools Quantico Va the enlisted man has to possess a minimal General Classification Test score (120 without college 115 and 110 with 2 year college equivalency) and be recommended by his commanding officer This recommendation is usually based on the judgment of a board of local officers who considered the man's officer potentialities especially his chances of surviving the screening course Within the Corps the three week screening process is currently regarded in many ways the most rigorous road to a commission Selection of those for commissioning also has been rigorous percentagewise as well as physically with the percentages of men commissioned even from a select group ranging from 45 to 72 The screening process at Quantico is designed to allow candidates the widest possible opportunity to demonstrate leadership potential, and includes tests and field exercises aimed at assessing physical stamina level of intelligence ingenuity forcefulness command presence leadership of structured and of leaderless groups ability to communicate ideas and awareness of current general and strategic problems Recommendation for commissioning comes from the commanding officer only and is guided by a consensus of the experienced Marine Corps officers all men of considerable combat experience who are detailed as assessors Criteria for the assessors' recommendation of a man has some flexibility at times At the time of greatest need for combat platoon leaders it could be expressed by the question Would the average platoon in a fire fight in Korea be better off with this man as a second lieutenant than it would be with the sergeant presently in charge? At the most rigorous selection time the question probably was something like Is this man distinctly superior to the present second lieutenants in the Corps? or Is this a man I as a company commander would have unwavering confidence in if he were one of my platoon leaders? or even Would this man make a good major or colonel in the Corps?

The efficiency of the selection procedures from the ranks has been tested empirically by operational decisions at various points. The first is the obvious one where some men are commissioned and some are not. The only crucial factor in the decisions as to who shall be commissioned has been the vote of the Marine Corps assessors. The purpose of each aspect of every subcourse of the screening procedure is to provide these experienced judges with as wide an opportunity to observe the candidates in stressful situations as possible. The stress from situation to situation is deliberately varied, so that the man who excels his peers in a situation where resistance to physical stress is important may not appear so outstanding in one where a decision from a leaderless group is required. I might say that some of the psychological tests which have shown disappointingly low discriminations have been kept in the program beyond their expected life span because they seemed, in the candidates' opinions, to be somewhat mysterious and "hard to fake," and because some of the men identified among candidates as "hard chargers" were stumped by them. The effect of this emphasis on stress and on not knowing what comes next is to keep nearly all candidates in doubt of their status throughout the course.

After commissioning the Marine Corps sends new second lieutenants, regardless of previous experience to Basic School, Marine Corps Schools, Quantico where for several months, the length of the course depending on the state of the national emergency, they study the problems of the officer of company grade with emphasis on the combat function of the Marine Corps. At the end of this course each officer receives a grade in academic work and in leadership, and a final combined grade which ranks him. Officers selected from the screening course are found in substantial numbers in the top deciles, quintiles, and halves of these classes and are found infrequently in the lower sections. Judged by their ability to compete with graduates of Naval ROTC programs, the U S Naval Academy, and civilian college programs, these men are more than adequate.

The particular group reported on for combat proficiency consists of 66 second lieutenants in the U S Marine Corps, serving with the First Marine Division in Korea, while the Division was in a combat status. These represent 90 percent of the officers who might possibly be reported on, that is, former enlisted men commissioned through officer candidate screening courses and serving in Korea at the time of the follow up. All of these officers were involved in some aspect of combat operations. Thirty seven were with rifle and other combat platoons, 19 were with artillery and with operations, and 10 were with other services.

As the rating scale approach used in combat situations has some demonstrably satisfactory uses⁷ as well as the ad

vantages of economy and celerity a rating scale was used To assure independence of raters judgment as possibly or popularly differentiable from regular fitness report data ratings were returned directly to me and not through military channels It was hoped that biases popularly supposed to be typical of fitness reports might be avoided In point of fact fitness reports of second lieutenants are generally so normally distributed that it appears there is no bias in reports for that lowest level of commissioned rank The scale itself included 14 items in order to allow some comparison of presently studied groups with World War II research on Marine Corps officers The other items were directed toward obtaining some estimate of efficiency under combat stress emotional maturity drive, expression of feelings, flexibility and respect of peers

The 66 returned rating scales were dichotomized to separate the men rated outstanding from those with ratings approximating mediocrity in the characteristics listed The results of this dichotomy were compared with results of psychiatric rating based on interview the psychologist's subjective estimate of officer potential estimated from over all Rorschach protocol a medico-psychologic rank order arrived at by a short conference between the interviewing psychiatrist and the psychologist who made the Rorschach inquiry and evaluated the paper and pencil tests peer ratings of fellow officer candidates before commissioning final assessment at the end of the officer candidate screening course made by the experienced Marine Corps officers leadership grade earned at the end of basic school for second lieutenants and final grade at the end of basic school including academic achievement.

Noteworthy is the corroboration of the results reported by Williams and associates for the peer ratings Although their measure of peer evaluation was different from the one we used we now have further evidence that for certain situations a man's peers are the best estimators of his potential worth provided his peers are experienced marines Thus the best predictor of how a platoon leader in combat will be judged for over all effectiveness by his immediate superior is the estimate of his fellow candidates before he is commissioned Almost as good is the combined judgment of the Marine Corps officers who observed him competing with those peers while he was a candidate Measures which predict over all combat proficiency with less success are the psychiatrists rating after a 15 minute interview the candidate's academic achievement while studying the duties of a company grade officer and the ratings of leadership made while the man is in the first few months of his commissioned service at school

Peer proportional rank is also the best predictor of a characteristic defined as potentiality as a combat officer, and ranks with screening course standing in predicting day to-day consistency in moods and temper. Of course peer ranks and screening course standing are highly related.

A number of paper and pencil tests, initially selected for face validity because they purported to measure characteristics defined by assessors as critical, have not as yet been compared with combat ratings. On proximate criteria they proved less efficient than might have been expected. Promising empirical keys for interests as on the Kuder values as on the Allport-Vernon, and emotional factors as on the Rorschach test, lost much and sometimes all, of their discriminatory capacity on cross validation samples. This does not suggest that we believe that these personality areas are of little importance, but does suggest that the subtlety and inventiveness of our measurement of them are inadequate.

The usefulness of the officer candidate screening course is further suggested by some of the results of the Korean ratings. For instance, the correlation between final assessment before commissioning and the over all dichotomy is respectable and with good fiducial characteristics. The correlation between rating of over all opinion of the man as an officer in combat in Korea and the final assessment at screening is .34, and between the Korean rating on the degree to which he is respected and followed by men under his command and the final assessment at screening is .31.

One of the combat ratings which is not predicted by the Marine Corps officers recommending commissioning or not is the item of technical proficiency in one's billet (his $r = -.06$). This we believe is justifiable, for the screening course aims to select good men from any Marine Corps assignment, and is careful not to weight heavily previous infantry combat experience so that the enlisted man with such experience is rewarded over the man without it. We find peer ratings of little use in predicting this item. On this point our results are quite different from Leavitt's.*

Reaction to stress and fear as rated in the Korean situation proved quite difficult to predict. The psychiatrists' ratings of ability to withstand stress and of motivation were unrelated. Medico-psychologic rank order was positively correlated with rated ability to handle one's self ably in stressful or fear-provoking situations (.33), and peer ratings also had a positive relationship (.26). Inherent in the results here must be some of the conditions to which attention has been called by Lazarus and associates.* New leads in the assessment of men's reaction

to stress are offered in the results of the recent Korean study by Davis and associates

We have found that items that may successfully predict the status of an officer candidate at one stage of his selection or training career may not be so successful at career points later on a point cogently made by Kelly and Fiske¹ in their study of trainees. For instance we reported that certain items obtainable through a biographic inventory or personal history blank significantly differentiated between the best of the candidates selected for commissions and the lowest of those failing of selection. Among these were the education of the candidate's father, the extent of the candidate's active participation in football, basketball and baseball, whether a man had been a team captain, his religious affiliation and his self estimates of strength, endurance and courage. But when we look for differences in these crucial areas of personal background which might differentiate the outstanding combat platoon leader from the mediocre one, we find none.

Despite the relatively good results we show for peer ratings, I believe that some admonition should be given against possibly abdicating any present screening functions, especially judgmental ones, and turning them over to peer judgments. Logically, if peer judgments could predict any of the behaviors listed in the present table, respect of the men should be included. Yet one finds a correlation of .20 which lacks significance. It was also found that the judgment of Marine Corps screening assessors is significantly related. The peer ratings are a most promising tool, but maximally effective use of this tool awaits better analysis of the dynamics of its operation and refinement of the techniques appropriate to each situation warranting its use.

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STATISTICS ON THE BABY BOOM

The number of births in our country has continued at record high levels since the end of World War II. Well over three and one half million babies were born in each of the past seven years the number reaching nearly 4 million in 1953 or more than one and one half times the births in 1940. The sustained baby boom reflects a rise in fertility rates but to an even greater extent the increase in the married population.

Couples in our country generally begin to raise a family at a relatively young age. Thus in 1950 births occurred at a rate of 33 per 100 in families where the husband was under 25 years of age. That is each year about one third of the married men at these ages become fathers. The proportion is about one fourth for the men in their late 20's and one sixth for those at ages 30-34. The fertility rate is particularly high among young married women two fifths of the teen age wives had a child in 1950.

Family life in our country has benefited materially from the fact that most couples have their children at a relatively early age. For one thing the hazards of maternity are at a minimum at this period of life. Then too with mortality currently at a low level the prospects are good that the child will have the benefits of parental care during its years of dependency. Nevertheless there is always the chance that the individual family may lose these advantages by the untimely death of the breadwinner. This is a contingency to be provided for in the family budget.

—from *Statistical Bulletin*
Mar. 1954

CREW SELECTION FOR SUBMARINE DUTY

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SUBMARINE crews must be chosen with particular attention to demands that are peculiar to the service. This article reports group research on personnel selection and deals with submarine environment, existing assessment processes, and research hypotheses related to criterion development and methodology.

Special demands imposed by the submarine environment make selection necessary. Eighty men are encased in a cigar shaped tube about the length of a football field where all available space not occupied by propulsion, communication, and detection equipment must serve more than one purpose in providing facilities for recreation, eating, sleeping, and study. There are loss of privacy and situational factors predisposing to the formation of small isolated groups. In addition, there are other environmental factors, especially during wartime patrol activity, that add to the hazardous or threatening aspects of the submarine situation. These factors may be grossly categorized as (1) psychological stress factors in undersea warfare, and (2) physiologic impairment factors that enhance the noxious effects of the stress.

The first stress factor associated with undersea warfare is the instability of the submarine as a weapon. It is the only naval vessel which operates in three dimensions. Loss of depth control will result in eventual crushing of the hull, and simply being submerged makes such usual hazards of mariners as fire, collision, and grounding much more serious. Escaping from a disabled submarine at a depth of as much as 300 feet presents a serious risk. The second factor is the nature of submarine operations. During war patrols, men must live on board submarines for as long as 60 or sometimes even 90 days. In addition, the submarine usually operates by itself, and the absence of contact with other friendly forces creates a feeling of loneliness. The third factor is the nature of antisubmarine tactics. Under attack, the submarine can do nothing but make limited efforts to evade its antagonist and cannot fight back. The crew must remain as silent as possible in a hot, humid, and tense atmosphere.

From U. S. Naval Submarine Base, Groton, Conn.
Proceedings of the 1953 Annual Meeting of the American Psychological Association
Ohio 9 Sept. 1953

Besides these stress elements to which a submarine crew must adjust, there are environmental hazards which impair the physiologic function of the men. We have reason to believe that the cumulative result of fluctuation of pressure, increase of carbon dioxide tension, and reduction of oxygen tension may have some effects on performance.

The task of the medical research laboratory at this naval base has been to select men who are able to adjust optimally to this kind of environment. The problem has been made much less complicated by the fact that the Navy has been able to continue the policy of making the submarine service entirely a volunteer one.

EXISTING ASSESSMENT PROCESSES

At this point it might be well to consider the life cycle of the submariner. Volunteers for submarine duty are obtained both from the fleet and from recruit training centers. They are then assessed at this base, and those who have physical defects or personality disorders which render them a poor risk for submarine duty are rejected. The remainder go on to basic submarine school. Those completing the school are sent to a submarine where, after about six months, they must have completed a notebook containing drawings of all the piping and ducts on the submarine and must pass a practical examination. If they are successful in this, they become "qualified" with the right to wear the dolphins on their uniforms; otherwise they are disqualified. Even a qualified man whose performance later falls below what his commanding officer considers to be the standards of the submarine service, can then be disqualified.

The assessment procedure consists of psychologic tests, to be described later, a physical examination for any evidence of active or chronic disease, special sensory testing which includes pure tone audiometry and a sonar aptitude battery. All of these are administered by the group method. Near normal color perception is required, but visual requirements are adjusted according to the man's rating or job. The candidate is next subjected to a 50-pound pressure test in a recompression chamber to test his ability to equalize pressure. He is then given submarine escape training. These two procedures provide a stress provoking situation for candidates with excessive amounts of anxiety or those with specific fears such as claustrophobia. Finally, an interview is conducted by a submarine medical officer where the assessment is concluded by integrating the results of the foregoing examinations and tests. From the outset of the program at this base, a great deal of the research effort has been directed toward criteria development, the assumption being that until we are able to discover reliable operational

criteria defining a successful submariner it will be impossible to ascertain the validity of prediction variables

METHODS OF CRITERION RESEARCH

The criterion research may be broken down into four overlapping areas arbitrarily defined as (1) pools of traits defining the good and the poor submariner (2) performance and achievement criteria (3) investigation of the qualify/disqualify criterion from the standpoint of discovering the contingent criteria associated with the dichotomous criterion groups and (4) sociometric criteria. The areas of research emphasis are indicated in figure 1.

In the first area of investigation that is description of submariners at the trait level experienced submariners were asked to describe a "good" and "poor" submariner and to give an incident exemplifying the "good" and "poor" traits they observed in these men. By this method a trait population consisting of 78 traits and behavioral phrases describing both good and poor submariners was sorted by 14 officers and a Q type cluster analysis was performed. A cluster was found to be composed of the following positive criterion traits: dependability, emotional stability, and maturity, alertness and intelligence, and no signs of nervousness. The negative criterion traits were found to be dreaminess, "lone wolf" characteristics, recklessness, shyness, and submissiveness, and self pity.

In the second area that of performance and achievement several criteria have been investigated. Such items as grades, class rank, and ratings in the submarine school and various service schools have been investigated as intermediate criteria. Other performance criteria are being investigated by Wilson in submarines at San Diego in an effort to develop a criterion of ship-board performance.

Previous studies involving practical performance tests, performance checklists, and rating scales have indicated that rating methods would provide a reasonably reliable estimate of performance in two broad areas—personal adjustment and technical competence. The rating scale approach seems to fit our current research needs best although the use of rating scales as criteria of performance aboard submarines poses several problems. These arise because (1) the 10 or more men who make up each submarine crew represent 10 or more technical specialties and several pay grades, (2) aboard submarines there is a great deal of flexibility in job assignments, and (3) there is a great difference between submarines. Ideally, for the purpose of comparing men from submarine to submarine, the rating scale should yield an absolute score in each of the areas of technical competence and

personal adjustment. Our past experience had indicated however that (1) even statements about specific observable behavior did not lead to satisfactory valid ratings of that behavior (2) raters will agree in general on the rank ordering of a group of men but

ABILITY TO EXERT AND INSTRUCT

(Group)

No one of the grade who did not have a good

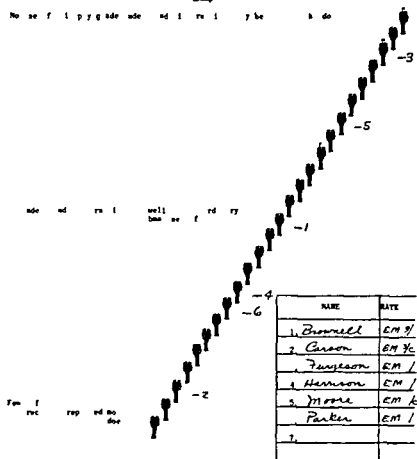


Fig. 2

the absolute scores they assign may differ greatly (3) in an effort to make ratings comparable from submarine to submarine and from rater to rater a common reference statement such as "the typical third class electrician's mate I have known" or "the best engine room striker I have known" may prove helpful (4) rated ability is so closely related to pay grade that any study of the validity of predictors using ratings as a criterion must be performed on a within pay grade basis. These considerations largely dictated the structure of the rating scale finally developed which is shown in figure 3.

In the third area of criterion development—namely, investigation of the “qualify disqualify” criterion, a study just completed yielded interesting subsidiary variables, some of which may be considered as predictors of the criterion, others as subsidiary criteria. For example, time to qualify and ratings at the time of qualification may have criterion possibilities, while education, time in service, and the more subtle variable of motivation for volunteering for the submarine service in the first place appear to have possibilities as predictors. During a recent experiment known as Operation Hideout, where 23 men were confined in a submarine for two months, a study was made to determine why they had volunteered to be subjects. It was learned by indirect means that one significant reason for volunteering was the person's desire to identify himself with something big or important. This motive may have arisen from feelings of inadequacy, insecurity, and unsatisfied achievement. It would appear that this has some general application to all volunteers for hazardous duty.

PREDICTOR RESEARCH

The present predictor combination is shown in the right-hand column of figure 1. It will be noted that the basic battery score is used, together with a personal history form and a group thematic apperception test. In the semistructured interviews, the medical officers make ratings of the listed factors on a 4 point categorical scale.

The group form of the thematic apperception test⁷ is used as an interviewing aid to ascertain the presence or absence of serious unresolved conflicts. In spite of the absence of empirical validity for the value of this instrument, we have found that when there are salient deviations from the usual or standard stories to a particular picture, subsequent psychiatric examination usually reveals personality abnormalities which make the man a poor submarine risk.

Extensive investigations of our assessment interviews were made by Pashalian and Crissy⁸ in which 109 interviews were recorded and analyzed for content, speaking time patterns, and both intra rater and inter rater reliability and 682 interview decisions were analyzed for validity against an immediate criterion of “pass fail” in the basic submarine school. They found an inter rater consistency of 98 percent and an accuracy of 95 percent in predicting graduation from the school. In passing it can be said that though 94 percent of the candidates in the school graduate the screening of these men by interview raised this figure an additional percentage point to 95 percent. The validity is on the order of + .92.

Bartlett explored the validity of the Navy basic battery as used during World War II in predicting submarine school grades. He found validities of + .35 to + .50 for basic submarine school and the electrical schools which follow it.

Wilson studied the validity of an experimental battery of tests including the Navy basic battery for both the school criterion and the technical phases of shipboard performance as measured by practical performance tests. He reports validities of + .50 to + .60 for the school and + .40 to + .60 for the practical performance shipboard measures.

These comments are offered to indicate our present position in relation to the main problem—the prediction of successful adjustment and successful performance in submarines. I have not discussed criterion reliabilities; however, the school criterion shows a reliability of about + .60. The shipboard performance tests yield estimated reliabilities of + .80 and higher.

SUMMARY

Duty in submarines imposes unique demands and stresses which require that crews be carefully selected. Assessment of volunteers includes physical examination, psychologic tests, and an interview in addition to performance in escape training and basic submarine school. Criterion and predictor research is based on the requirement for reliable criteria for predicting a successful submariner.

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"OPERATION RECOVERY"

MILTON R WIRTHLIN *Captain (MC) USN*

THE U S S *Consolation* visited Chinhae, Korea on 11 and 12 January 1954, as part of the Korean rehabilitation program, to conduct a survey of the patients at the Republic of Korea Naval Hospital, with a view of embarking those Korean military patients who could be benefited by further treatment. I believe that a resume of the U S S *Consolation's* visit and a report of the conditions encountered may be of interest to both civilian and military physicians

Prior to our arrival at Chinhae, professional evaluation teams for general surgery, orthopedic surgery, neurosurgery, ophthalmology and otolaryngology, genitourinary surgery, internal medicine, and oral surgery were established to survey the various categories of patients and to select for transfer a maximum of 200. Upon arrival, the officer in command and members of the evaluation teams proceeded to the hospital for a conference with Captain Chuhyung Pak, Surgeon General, ROK Navy, and Captain Kiho Pak, Commanding Officer of the hospital. The purpose of our visit and the plan of operation were discussed and readily accepted by Captain Pak. At this time it was learned that the patient census was less than 500, of which about 157 were patients with active pulmonary tuberculosis hospitalized separately a considerable distance from the main unit.

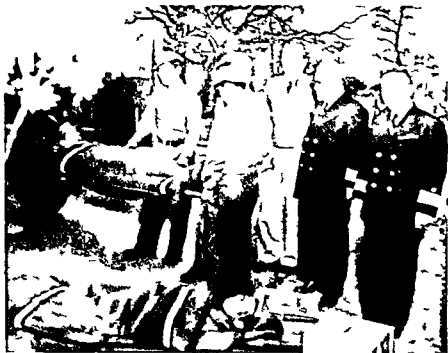
When evaluation team members met their counterparts on the staff of the hospital, "Operation Recovery" was begun. Following each team's survey and consultation its senior member gave Captain Pak a detailed report on the patients examined and an evaluation of their medical care.

RESUME OF TEAM FINDINGS

General surgery There were two general surgical wards with a total of 83 patients. Consultation was requested on five patients, and two were presented for possible embarkation. The general surgical evaluation team saw each patient on this service and selected four for embarkation, three for reconstructive surgery, and one for diagnostic study and possible operation.

From the U S S *Consolation*, FPO Sa Fr 1 co C 14

Of these 83 patients 19 had had rectal operations five had had operations for tuberculous lymphadenopathy of the neck and nine had had appendectomies. Nearly all of the remaining 40 patients were ambulatory and about 50 percent appeared in satisfactory condition for discharge or return to duty. The general surgeons at the hospital discussed their patients' conditions and they appeared to have rendered adequate surgical care. The main difficulties were lack of trained anesthetists, antiquated operating facilities, meager x-ray equipment, and a shortage of whole blood. Surgical technique and operating room procedures were not observed.



From right to left: Capt. I. K. Pak, Commanding Officer of the ROA Naval Hospital, Chibiha; Capt. Ch. Hyung Pak, Surgeon General of the ROA Navy; and Commander E. J. Jarreau, MC, USA, representing transfer of ROA military patients to the U. S. S. Coriolis.

Orthopedic surgery. There were two orthopedic wards with about 60 patients under treatment. Consultation was requested on 31 patients and seven were presented for possible embarkation. Forty-three patients were seen in consultation and three were accepted for shipboard treatment. The other four presented for possible embarkation but not accepted were patients with chronic osteomyelitis which was characterized by minimal drainage from the sinuses and an absence of systemic symptoms; did not warrant operation at this time.

The treatment efforts of the hospital's physicians appeared directed principally to patients with recent fractures and dislocations, while the treatment of patients with orthopedic problems requiring prolonged care seemed of secondary interest. Conservative treatment of patients with fractures, either by plaster immobilization or traction, was not observed. Lack of fracture beds and inability to improvise them probably accounted for the number of open reductions performed on patients with recent fractures. The incidence of postoperative wound infection appeared high. Atrophy from disuse, involving bone and soft tissues, was apparent—due probably to improper support of the patients



The neurosurgeon (center) from the Naval Hospital in the U S S Consolation examining a patient with the neurosurgeon (right) of the ROK Naval Hospital Chinhae Korea.

while in plaster casts, too early discontinuance of plaster immobilization, failure to ambulate patients in casts, or insufficient and improper use of the adequate physiotherapy equipment.

In defense of the orthopedic staff it should be mentioned that, because they were interested only in obtaining consultations on their problem cases, their patients showing good results were not seen.

Neurosurgery There were two neurosurgical wards with about 65 patients. Consultations were requested on 56 patients, and

four were presented for possible embarkation. The neurosurgical evaluation team examined and offered technical advice on 65 patients. Of the four presented for possible embarkation one was a paraplegic secondary to arachnoiditis who had been explored surgically; another had paraplegia of eight months' duration secondary to lumbar cord injury; the third was a questionable case of Raynaud's disease but sympathectomy was not justified until adequate therapy would rule out the possibility that a fungus infection of the fingernails might be a contributing factor to his difficulty; the fourth was a patient with a peripheral nerve injury with returning function merely requiring continued physiotherapy to correct the contractures.

The majority of the patients seen in consultation had peripheral nerve injuries and almost all showed evidence of recovering function. Neurosurgical care was good; however, again the chief criticism was the lack of active physical therapy.

Ophthalmology and otolaryngology. There was one ward assigned to this service with about 19 patients. Consultation was requested on 16 patients with diseases of the ear, nose or throat and three with diseases of the eye. No patients were presented for possible embarkation. All of the 16 patients were receiving excellent care and the majority were ready for duty.

Urology and dermatology. This service shared a ward with the oral surgery service. Three patients with urologic conditions were presented for consultation and two of these were embarked for further diagnostic study. The urologists on the hospital staff seemed well trained and presented evidence of their technical ability. They were unable, however, to perform cystoscopic examinations because their only cystoscope was inoperable. No dermatologic cases were presented for consultation or embarkation.

Oral surgery. There were only seven patients in the oral surgery ward and consultation was requested on one. This patient had a simple fracture of the left mandible without artery or nerve involvement. The fracture union was firm and dental occlusion good. Further treatment was not indicated and it was recommended the patient be discharged to duty.

Internal medicine. The medical service had a census of 56 patients including psychiatric patients. Patients with tuberculosis were hospitalized in a separate unit. Ten patients were presented for consultation but none for embarkation. Three patients presenting diagnostic problems were selected for embarkation: clinical studies and treatment. The patients examined were a representative cross section of those usually seen in any military hospital. Each case was discussed thoroughly from diagnostic, therapeutic, prognostic viewpoints and disposition.

The internists appeared to be performing excellent work in spite of the lack of modern diagnostic, therapeutic, clinical or laboratory aids. The supply of drugs was inadequate at the time of our visit, and no insulin was available.

Tuberculosis service The tuberculosis service had a census of 157 patients. 146 of these were suffering from pulmonary tuberculosis, of whom 74 had bilateral involvement. Consultations were requested on 11 patients, and 10 were intended for embarkation and surgical procedures. With one exception, all these had advanced bilateral pulmonary tuberculosis. Pneumothorax and pneumoperitoneum as well as combined chemotherapy had been used with indifferent results. In some cases, planned therapy had been in progress for too short a time to determine the value of this regimen. The patient with unilateral disease presented for embarkation had had an ineffective pneumothorax, and might be a candidate later for thoracoplasty or resection. The other patients presented for embarkation, not considered for surgery because of active contralateral involvement or acute exudative disease, were doing well on combined chemotherapy and temporary collapse.

Accepted standards of temporary collapse, pneumothorax, and pneumoperitoneum were used, as well as streptomycin, para-aminosalicylic acid, and isoniazid (isonicotinic acid hydrazide). Lack of adequate case-finding facilities apparently results in the majority of patients with tuberculosis being admitted in advanced stages of the disease.

SUMMARY OF OBSERVATIONS

The structural plant of the hospital was old and in a poor state of repair. Few buildings had steam heat but most wards were heated by one or more oilstoves. The efficiency of the heating units was impaired by many broken windows and ill fitting or missing doors. Sinks, including operating room scrub-up sinks, consisted mostly of unfinished concrete basins. Piping and fittings were old, and many leaks were in evidence. Ward washrooms were unheated and crude. Laundry facilities were notable by their absence.

Operating rooms were primitive by American standards, and inadequate even by prewar Korean standards. Floor tile was in disrepair, and safety devices were absent. Overhead operating lights and autoclaves while old fashioned, appeared to function well. The operating tables were of the army field type. Lighting was poor throughout the hospital, wiring was crudely installed, and in many places was bare of insulation. Power fluctuations and failures are frequent, and interfere with the operation of diagnostic equipment, x ray machines, etc.

Galley facilities were not inspected and food service not observed. Technical equipment was scant throughout the hospital. X-ray facilities consisted of one U S Army type field unit; however, in spite of electric current fluctuations, satisfactory roentgenograms were demonstrated. Physiotherapy equipment for the most part was improvised, but the hydrotherapy equipment was modern, and all equipment was capable of being used with effective results. Hospital beds were either iron or wooden cots, and no fracture or modern hospital beds were available. Dressing carts were primitive and poorly equipped for aseptic technique. Diagnostic units and surgical instruments were scant; no apparatus was available to obtain metabolic determinations or electrocardiograms.

The professional staff appeared to be performing excellent work in spite of the above-mentioned handicaps. Nursing care and overall cleanliness of wards appeared adequate under the circumstances. All medical officers, especially the heads of departments, were well trained and discussed their cases intelligently. The fact that only 12 Korean military patients were selected for embarkation for further diagnostic studies and surgical procedures speaks well of their professional staff. Administratively, the hospital organization was sound and functioning well with limited funds.

CONCLUSIONS

All participating officers believed that their first-hand observation of a ROK naval medical facility, the mutual exchange of technical ideas on 281 clinical patients, and the U S Navy's offer to be of assistance made Operation Recovery well worth while, and did much to foster a mutual admiration between the Medical Corps of the two countries.

CONSULTANT IN KOREA

In the early summer of 1953 I had the opportunity of going to the Far East as a Surgeon Consultant to the Surgeon General (of the Army). I came home glad about everything else that I am an American, I brought with me vivid memories of the shooting war. I had witnessed a breathtaking admission for the young medical officers in uniform service, great respect for the brotherhood of doctors everywhere, a determination that my child shall study other languages and learn tolerance of the people's countries and customs, a strange competence with chopsticks, a new Contact me 1000 color pictures— I left half out of focus, my Ridgeway cap, and an empty pocketbook.

—T G BLOCKER, J M D

Plastic and Reconstructive Surgery
pp 1-18 June 1954

Peripheral Facial Paralysis Treated With Cortisone

AARON M. BERNSTEIN *Lieutenant USAF (MC)*

UNTIL recently the treatment for peripheral facial paralysis (Bell's palsy) has consisted of splinting the muscles involved, gentle massage, electrical stimulation, and the administration of various vitamin preparations. It is believed that cortisone lessens the acute edema and inflammatory reaction of the facial nerve and its sheath as it passes through the fallopian aqueduct. Rothendler¹ obtained excellent results with cortisone in the treatment of six out of seven patients with Bell's palsy, and Robison and Moss² successfully treated two patients suffering in the early stages of the condition.

CASE REPORT

A 20 year old airman who entered this infirmary on 12 January 1954 gave the following history. On 4 January, while on the job he noted a numbness over the left side of his face and found that he could not close his left eye completely. During the week his symptoms became worse, the numbness over the left half of the face increased, he could not whistle, his mouth was pulled to the right upon smiling, his taste sensation diminished and food tasted peculiar, the left side of his forehead would not wrinkle upon frowning, and his left eye would hardly close.

Physical examination revealed a well developed Negro who could not wrinkle the left side of his forehead, his left eye would not close completely, the nasal fold on the left was flattened, and his mouth was pulled to the right, and there was numbness over the left side of the face. The remaining part of the neurologic examination was not contributory. There was tenderness in front of the left ear.

The patient was hospitalized on 13 January 1954 and given 50 mg of cortisone three times a day. On 14 January he received 50 mg twice a day. On 15 January 25 mg three times a day, and on the following two days, 25 mg of cortisone twice a day. No other treatment was given thereafter. On 15 January the patient

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noted that the numbness of the left side of his face was diminishing. During the next two days marked subjective as well as objective improvement was noted. His left eye would close, he was able to wrinkle his forehead, and he could whistle. By 20 January 1954 there were no objective signs of seventh nerve disturbances. The patient stated he could feel nothing unusual in his facial movements. He was seen a week later and a month after that and nothing unusual had occurred.

COMMENT

The speed with which this patient reacted so favorably tends to support the reports by Rothendler and by Robison and Moss that the use of cortisone is promising in the treatment of peripheral facial paralysis.

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HIGH ACCIDENT RATE AMONG WOMEN

Accidents take a heavy toll of life among women. In our country more than 22,000 women at ages 15 and over die each year as a result of injuries sustained in accidents. Even in the age range from 15 to 64—before the infirmities of age begin to play an appreciable role in mishap—the annual toll is 10,000. More women at these ages die from accidents than from any other cause except the cardiovascular diseases and cancer.

It is rather surprising that only one quarter of the fatal accidents among women under age 65 occur in and about the home in view of the large proportion of time that women spend there. Modern equipment and appliances among other improvements have made the American home a much safer place in which to live. Motor vehicle mishaps constitute the major hazard, accounting for more than half of all accident fatalities among women. Public places other than streets and highways are the scene of almost all the remaining deaths. Although many millions of women in our country are in the labor force with large numbers engaged in factory work, few are killed in industrial accidents; less than one percent of the fatal accidents among women at the main working ages of life are out of and in the course of employment.

—from *Statistical Bulletin*,
May 1954

Can Molluscum Contagiosum Be a Venereal Disease?

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OVER the past several years, I have observed many cases of molluscum contagiosum exclusively located on the genitalia of young soldiers. The majority of these men had had repeated intercourse with Korean prostitutes and a few had had sexual intercourse both in Korea and the United States before the lesions were noted. Ormsby and Montgomery¹ stated, "In occasional instances, patients mistake these lesions when situated upon the genitalia for some form of venereal infection, but this is soon corrected when examined by a physician." Using



Fig. 1. Lesions of molluscum contagiosum on the shaft of the penis.

the definition of venereal literally. Due to or propagated by sexual intercourse,² it must be considered that this is indeed a venereal disease in these cases. MacLeod and Muende³ stated that the inoculation experiments with the virus have resulted in the formation of the typical pearly tumor after an incubation period varying from two to seven weeks. Many of the soldiers now being seen had not noticed the lesion for many months after

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their last exposure in Korea. Therefore, unless specific inquiry about such exposures is made, one will be unaware of the sexual significance of the lesion.

The lesions are easily recognized as small translucent or skin-colored wartlike tumors with a central umbilication from which creamy sebaceouslike material can be expressed (fig 1). Biopsy specimens of the lesions presented the typical pathologic picture. All lesions were treated with simple desiccation and curettage.

Barrett and associates recently reported 70 men with genital warts (condyloma acuminatum) stationed at Camp Atterbury, Ind., 65 of whom had been stationed in Korea and Japan and admitted contact with native women. Twenty-four wives whose husbands admitted sexual relations with native women also had similar lesions. This study indicates a similar mode of infection in the transmission of molluscum contagiosum and is corroborative evidence of its venereal classification.

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PREVALENCE OF PROSTATIC CARCINOMA

The remarkably high incidence of carcinoma of the prostate in men more than 50 years of age is probably not yet fully appreciated by many in the medical profession. Incidences ranging from 15 to 30 percent have frequently been reported in routine autopsies of men in the older age brackets. This means that nearly one third of the male population over 50 there is a possibility of the development of prostatic carcinoma. It would also indicate that at present between 3,000,000 and 5,000,000 men in the United States probably have carcinoma of the prostate. Carcinoma is the cause of prostatic obstruction in approximately one fifth of cases of the latter condition encountered clinically.

—W. E. KITTREDGE, M. D.

Journal of the International

College of Surgeons

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Cryptitis With Pinworm Infestation

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INFESTATION of the rectal sinuses with *Enterobius vermicularis* (*Oxyuris vermicularis* pinworm) is a sufficiently unusual cause of cryptitis so that the diagnosis is likely to be missed unless the possibility of such infestation is borne in mind. In the case described below, the cause of the cryptitis was assumed to be impacted particles of feces or a similar condition until the worms were revealed at operation.

CASE REPORT

A 20-year old man was admitted to this hospital on 9 September 1953 complaining chiefly of intermittent, pronounced perspiration and burning around the anal region "as sweet in an open cut," for the previous two years. These intermittent periods of pruritus and perspiration had been occurring more frequently and lasting longer (four or five days at a time) for six months prior to this hospital admission. The patient had noticed an occasional brownish watery drainage from the anus which stained his underclothing and was associated with blood streaking on the toilet tissue after bowel movements. He also had experienced a rather intense anal pruritus with an associated "crawling-like" sensation for brief periods after defecation but no symptoms at night or between bowel movements. There had been no diarrhea, constipation, dyschezia, nausea or vomiting. Mild abdominal pain occurred only after emotional crises.

The past history, family history, and review of systems were noncontributory, and no abnormalities were noted on physical examination. Urinalysis, complete blood count, and roentgenogram of the chest were within normal limits. No elevated eosinophil count or leukocytosis was noted, even on repeated studies. Anoscopic and sigmoidoscopic examinations revealed only hypertrophied anal papillae and small internal hemorrhoid in the primary planes.

On 18 September hemorrhoidectomy and cryptectomy were performed. On excision of the anal crypt over the left lateral hemorrhoid two pinworms were found. Exploration and excision of other crypts revealed no additional enterobius.

From U. S. Naval Hospital, Oakland, Calif. Dr. Aquadro is now a resident at the U. S. Naval School for Deep Sea Diving.

Despite several postoperative examinations for ova and parasites in stool specimens and the making of cellulose tape slide studies no other evidence of pinworm infestation was noted. The patient was started on a course of enteric coated methyl rosaniline chloride (gentian violet) tablets as treatment for enterobiasis and was discharged to duty following healing of the operative site. Shortly thereafter he was released from the service so that follow up reports are not available.

DISCUSSION

Cryptitis Cryptitis which is characterized by inflammation of the crypts of Morgagni is usually found in association with anal papillitis.¹ The anatomic arrangement of the crypts with their openings facing upward toward the rectum is a predisposing cause of inflammation and infective processes in the anorectal region. The crypts become nidi of infection from particles of feces, mucous secretions and foreign bodies.² They may contain pathogenic bacilli, flagellates, coccidia, amebas or segments and eggs of helminths. The crypts of Morgagni also furnish starting points for most infectious anorectal disease. Cryptitis is the most frequent cause of anal fissure; it is a factor in causing pruritus ani and often is the initial cause of hemorrhoids. Infected crypts may serve as loci of internal openings of anal fistulas. Cryptic infestation with *E. vermicularis* may lead to an ischiorectal abscess due to burrowing of the parasites through the anorectal mucosa.

The pain caused by cryptitis is usually sharp or burning, less frequently a dull ache. It is usually increased by defecation after which a feeling of discomfort or uneasiness may develop. The patient dreads a bowel movement and constipation may arise from postponement of defecation. Itching, often not relieved by scratching, is another symptom. There may be a sensation also of crawling aggravated by perianal moisture. A mucoid or mucopurulent anal discharge from the crypts may represent inflammatory exudate or result from reflex stimulation of the mucosa. Reflex pain may be referred to the urogenital area, the sacrum, the coccyx or down a lower limb.

The diagnosis of cryptitis is made by digital and anoscopic examination. On digital examination a tight anal sphincter is usually encountered together with thickened granular or inflamed crypts. On anoscopic examination the crypts are exposed and crypt hooks can be inserted for better exposure. Early diagnosis and treatment of cryptitis may prevent such complications as papillitis, perianal abscesses, fistulas, ischiorectal and retrorectal abscesses, fissure and pruritus ani.

The treatment of cryptitis may be palliative or surgical. Palliative care consists of local cleansing with warm rectal irrigations, applying caustics, use of ichthammol (ichthyol) suppositories, sitz baths, softening the stools by use of mineral oil by mouth, and a nonconstipating diet. Surgical treatment is excision of the involved crypts.²

Enterobiasis Enterobiasis has been known to exist since ancient times. The worm is widely distributed, but is more common in warm climates. The male worm has a length of from two to five millimeters, the female, from eight to thirteen millimeters. They are both spindle shaped in the adult form.³ "The adult worms inhabit the cecum, appendix, and adjacent portions of the ascending colon and ileum."⁴ "*E. vermicularis* requires neither an intermediate host nor a period of incubation outside the body. The intense itching, produced by the gravid females crawling out the anus" onto the perineal and perianal region to deposit their eggs, leads to scratching the involved area. Eggs are scraped up by the fingernails and eventually get into the mouth by way of the fingers. Since the pinworm ova resist drying, they may remain attached to soiled bed linen or clothing, and infection may be spread by handling these articles.

In brief, the life cycle begins with the embryonated egg in the duodenum. The egg hatches and the larva spends about two months in the small intestine. Here the worm mates and passes into the large intestine, where it attaches to the mucosa and develops into adulthood. When the adult female becomes gravid, it releases its hold on the wall of the intestine and passes into the rectum, out of the anus, and oviposits on the perianal or perineal region. The eggs may be transferred to the mouth as described above, and the cycle is repeated.⁵

The adult worm in the lumen of the bowel or appendix, by mechanical means or by lysis, may cause hemorrhage. Catarrhal inflammation of the mucosa may allow entrance of secondary pathogens. Pruritus ani is probably the most distressing symptom of pinworm infestation, and the scratching provoked by the pruritus may result in local hemorrhage, eczema, and pyogenic infection of the anal and perianal regions. If the worms infest the rectum in sufficiently large numbers, violent rectal colic may be produced. They often enter the vagina, especially in children, from the perianal region, pass through the uterus into the fallopian tubes, and thus cause salpingitis. Parasites may continue on through the tubes and even enter the peritoneal cavity where they become encysted in the peritoneum.⁶

In infants and children, and to a certain extent in adults, nervous symptoms of various types have been attributed to pin

worm infestation Anorexia nausea vomiting and diarrhea may occur along with reflex irritation of the genitalia abdomen and legs

Diagnosis is usually made by finding either the worms or their ova in material scraped from the perianal area¹ but adult worms may be discovered in the perianal region or in the feces particularly after an enema Ova are frequently obtained from finger nail scrapings but are seldom found in the feces even with concentrative methods² Best results are obtained by swabbing the perineal skin the first thing in the morning before a stool is passed and before a bath is taken The swab may be a one inch square of cellophane folded over one end of a glass rod and held to the rod by a rubber band or cellulose tape adhesive side out on the end of a wooden tongue blade The latter is simpler to use the tape being removed after swabbing and placed adhesive side down on a microscope slide for direct examination Repeated examinations on nonconsecutive days should be made before the patient is considered free from infection

Chenopodium oil preceded by a purgative tetrachloroethylene and hexylresorcinol has been of some success in the treatment of patients with pinworm infestation However the most reliable and most successful therapeutics consists of the oral administration of tablets or capsules of methylosaniline chloride The adult dosage is 60 mg three times daily for eight days Then the patient rests a week and repeats the treatment Careful search for continuing presence of adult worms is essential before therapy is terminated

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The Problem of Respiratory Insufficiency in Poliomyelitis

CHARLES H. NORHOUSE *Colonel USAF (MC)*

THE reports by Lassen¹ and Ibsen² of the recent epidemic of poliomyelitis in Copenhagen and how the problem of respiratory insufficiency was handled suggest that an evaluation of procedures and equipment is desirable for every military hospital before the actual onset of the so called "polio" season. It is fairly well established that the present trend of the disease in temperate climates is one of an increased attack rate on adults and in such cases respiratory insufficiency is far too common. Tank respirators are costly and as a rule are not available in great numbers either in a single military hospital or in a military area. When they are available, results from their use are not always satisfactory and nursing problems arise. Fatality rates, especially in bulbar cases, have always been high. Cuirass respirators are also in short supply. This article is written to call attention to the improvisation of pressure breathing apparatus from equipment usually on hand to augment such mechanical respirators as are in stock.

In the Copenhagen epidemic, a 500 bed hospital equipped with one tank and six cuirass respirators admitted more than 3,000 polio patients in five months. At the peak, 50 patients were received daily of whom one third were paralytic. To care for the patients with respiratory insufficiency it was necessary to improvise a type of apparatus for positive pressure breathing. After a tracheotomy was performed below the larynx a double tube with a rubber cuff was inserted into the trachea to permit manual positive pressure breathing. As Lassen and Ibsen stated, after this method was tried it became the treatment of choice and it became no longer necessary to face the decision of which patient should be given a chance to survive in one of the mechanical respirators which were limited in number.

The essential equipment used was a mixture of equal parts of oxygen and nitrogen from a cylinder connected through a humidifier by means of a reducing valve. A side branch of the cuffed tubes was connected with a metal container of soda lime. A rubber bag and control valve were used to regulate pressure. Suction

ing of secretions was done through a second tube of the rubber cuff. By means of this hurriedly designed equipment and with nurses and medical students to manually ventilate the patients 232 patients with respiratory insufficiency were treated. The mean mortality rate in these was 39 percent previous to the institution of such treatment the mortality rate had been 80 percent.

In a situation requiring additional help for patients in respiratory difficulties the average Air Force hospital has over and above any tank or cuirass respirators resuscitators and anesthesia machines. These are both better for use on patients with bulbar paralysis whether associated with intercostal or phrenic paralysis or as a separate entity.

The resuscitator is a standard item of issue to military hospitals. The unit carries its own suction pump which can be adapted by means of a short piece of tubing to make an endotracheal catheter. Three sizes of facepieces and airways are available and the unit can be attached to either a G or H oxygen cylinder. The resuscitator will serve only for transportation or emergency treatment unless it is adapted to provide a humidifier which is essential for continuous positive ventilation. Barach stated that humidity of at least 35 to 55 percent is necessary to prevent drying of the patient's respiratory mucous membranes.

Anesthesia machines are items of issue and may be of several designs and makes. From 300 to 400 cc of oxygen per minute is supplied and from 200 to 300 cc of carbon dioxide is absorbed as it is exhaled through soda lime which should be replaced at least once every four hours. Should the equipment be used by a patient with poliomyelitis the tank of nitrous oxide must be removed to safeguard against its accidental use. With a closed circuit humidity is not a problem but more moisture can be provided by filling the ether jar two thirds full of clean water or normal saline solution. Patients requiring positive pressure breathing do better if a low elective large tracheotomy is performed early. A cuffed endotracheal tube with its beveled end cut square is then passed through the tracheotomy and the cuff is inflated. Personnel must be assigned continuously to breathe for the patient by manually compressing the breathing bag from 18 to 20 times per minute. Secretions can be handled by frequent suction and even bronchoscopy can be performed through the tracheotomy. Endotracheal tubes should be removed and cleaned at least twice a day.

The most logical way to determine what is occurring in the bronchial tree of a patient is to perform as near direct auscultation as possible. Again standard equipment can be of great

value This can be accomplished by using a throat microphone attached to the patient and hooked up through an amplifier using either standard 110 volts or a battery, which can be done by most radio mechanics The amplifier can be placed in any selected location and constant observation can be made of the condition of the patient's bronchial tree Indications for suction and for forced ventilation can be detected early by this simple device

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REGULAR MEDICAL CORPS OFFICERS CERTIFIED BY SPECIALTY BOARDS

The American Board of Anesthesiology

Since its activation in 1937 the American Board of Anesthesiology has certified more than one thousand physicians in this specialty At present, according to the respective Surgeons General this number includes 22 regular Medical Corps officers, who are

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Fr d C Dy Col USAF	Charl s H M tch ll Col USA
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R bert R Jo Lt Col USA	D n i M P Comdr USN
J h F k ll g s J Lt Col USA	Edw d P Sha J Lt Col USA
J m G k r f Comdr USN	J h J Sh da Maj USA
R be E La Lt Col USAF	H rvey C Sl um Col USA
W lt L Lumpk J Lt Col USA	J l u s J S y d Lt Col USA
D d E MacQuigg Maj USA	A h B T w Lt Col USAF
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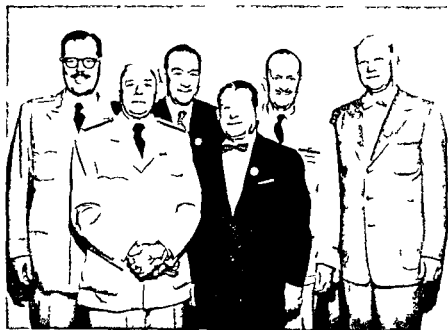
Rogers L. Henshaw, *First Lt. MSC, USA*

OKLEY Cluster

The names of officers of the medical service who have been awarded decorations by the United States Army Navy or Air Force are published in this department each month following receipt of information from official sources.—Editor

DR RAVDIN ELECTED 1955 CHAIRMAN OF A M A SECTION ON MILITARY MEDICINE

Brigadier General I S Ravdin, MC USA (Ret) succeeded Major General Harry G Armstrong USAF (MC) as chairman of the Section on Military Medicine of the American Medical Association at the close of the annual meeting in San Francisco in June. Rear Admiral Lamont Pugh, Surgeon General of the Navy was chosen vice chairman and Colonel Charles L Leedham MC USA secretary.



President and former officer of the A M A Section on Military Medicine
Lieutenant Colonel Charles L Leedham, MC USA (Ret) Admiral Lamont
Pugh (MC) USN Rear Admiral Richard A Kern (MC) USNR Brigadier General
I S Ravdin, MC USA (Ret) Major General Harry G Armstrong, USAF
(MC) and Colonel Charles L Leedham, MC USA (Ret) Secretary of the Section (Honorary and Medical)
Major General Armstrong

Dr Ravdin is a member of the Civilian Health and Medical Advisory Council to the Assistant Secretary of Defense (Health and Medical). The other members of the Executive Committee of the section are the two immediate past chairmen General Armstrong and Rear Admiral Richard A Kern (MC) USNR Philadelphia Pa and the A M A delegate Colonel Russell V Lee USAF (MC) Palo Alto Calif.

PUBLICATIONS BY OFFICERS OF THE MEDICAL SERVICES

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- Bullw k l H G C pt (MC) USN C l i t n a l e l New York State J M d. 54
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- Burch R J Col USAF (DC) I f e c t n o f b s c o n d r y t t r t m n t o f f r a t u r e
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Lt C l MC USA Hemostat c d f t s c t d w i t h d x t n a f u s *Proc Soc
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- G l R B L MC USAR Sh d y J A Maj MC USA Ekman C N Lt Col
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V R H L MC USAR L-a nol tr m f p d m h m hag f
 Am J A d 16 683-689 May 1954

A MESSAGE FROM THE A M A

In April this message was devoted to a summary of the interest and activities of the American Medical Association in connection with the enactment, amendment, and general administration of the "Doctor Draft Law." Because Public Law 84, 83d Congress, prescribed only *maximum* periods of service, the Association requested that the Department of Defense administratively reduce the period of service required of priority II physicians on active duty provided they had served 12 months or more during World War II. A letter was sent to the Department of Defense on 27 April 1954 calling attention to this situation.

A reply dated 7 May was received from Dr. Frank B. Berry, Assistant Secretary of Defense. Because of the inquiries which the Association and the Council on National Emergency Medical Service of the American Medical Association have received following the article in the April issue, Dr. Berry's letter is reproduced with his permission.

It has been the policy of the Department of Defense since the enactment of Public Law 779 to require physicians brought to duty to serve the maximum period prescribed by law. At the time amendments to Public Law 779 were being considered by the House Armed Services Committee and the Senate Armed Services Committee during the spring of 1953 the maximum period of service to be required of Priority II physicians was established after full consideration was given to all facets of the problem. In addition concern has been expressed by agencies such as the Health Resources Advisory Committee, Office of Defense Mobilization regarding the depletion of the pool of available physicians in civilian life who are obligated for duty under the Doctor Draft Law. Early release of medical officers on active duty would result in increased levies on civilian physicians. After considering these and other aspects of the problem it is believed that the Department of Defense policy of requiring the maximum period of service prescribed by law is consistent with the continuing necessity to bring physicians to duty from civilian life, the interests of the Armed Forces, and recommendations received from official agencies concerned.

As you know, shortly after the enactment of Public Law 779 during the fall of 1950, Department of Defense policy was established defining the basis upon which rank would be accorded physicians who applied for reserve commissions in lieu of induction. It was the intent of the Department of Defense to provide these physicians with the highest grades practicable. Accordingly, and as a criteria which could be uniformly applied, length of professional experience was made the basis for the rank to be received by physi-

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CORRESPONDENCE

To the Editor—I am writing to tell you that it is a pleasure to receive my copy of your *Journal* and that I have found myself reviewing the issues which have reached me during the past year with increasing pleasure and interest

In the June 1954 issue I particularly enjoyed the book review section both for the broad selection of books reviewed and for the fact that the reviewer has been allowed to express himself freely and in an interesting way

It seems to me that the *Journal* is now filling a unique place in medical literature as it should do with a good selection from the broadest field available to any editor a succinct style of writing and indications of excellent proof reading It is a pleasure to me to be able to compliment you on the quality of the *Journal*

ELBERT L. PERSONS M D
Duke University School of Medicine
Durham N C

RETIREMENT AFTER TWENTY YEARS SERVICE

(The following letter recently received by Dr Frank B Barry Assistant Secretary of Defense (Health & Medical) is published with the writer's permission.—Editor)

Dear Sir

I am writing you as one doctor to another and as a doctor who served in the armed forces during World War II I recall your message in the *U S Armed Forces Medical Journal* of April 1954 in which you advocate the implementation of a long range medical incentive program to attract young doctors into the armed forces as a career You stated

The first and simplest step might be the reintroduction of the 20-year retirement privilege Your statement with which I heartily agree is the whole purpose of this letter

I have followed the Arends Bill through Congress because of my interest in the problem and because Congressman Arends is from Illinois The bill passed both houses by substantial majorities It seems that now comes the implementation of the intent of Congress and that some one is going to make "Doctors" an exception and not permit 20 year voluntary retirements as was voiced during the hearings on the bill and which is contrary to your announcement in April 1954

Every member of our group of doctors has served in the armed forces during World War II. We are interested in this bill as reserv medical officers who desire to see a career in the armed forces be made more attractive for doctors. Since you are the highest doctor in the Federal Government it is hoped you will do everything possible to allow 20-year voluntary retirements.

LEO J. BROWN, M.D.
The Cabell Clinic
Carbondale, Ill.

ARMED FORCES MEDICAL LIBRARY

(The following list was compiled by Lt. Col. F. K. B. Rogers, MC USA, Director, Armed Forces Medical Library—Editor.)

Dear Sir:

I should like to acknowledge my appreciation of the Armed Forces Medical Library. During my tour of duty at remote stations the photostatic copies of reports supplied by the library have helped greatly to furnish medical information and to supply knowledge of recent medical reports. While in the Washington area the privilege of searching in the stacks has aided me in finding articles. I had otherwise been unable to locate. The extraordinary completeness of the library with its tremendous number of journals has allowed me to review the literature on certain topics more completely than is possible through any other library.

Many of my medical colleagues have been unaware of the rare opportunities that the Armed Forces Medical Library has to offer them. It would seem in order to call their attention particularly to the privileges of obtaining photostatic copies of articles for this service enables one to keep up in his field in spite of a remote location.

HUGO DUNLAP SMITH, Capt. MC USA
U S Army Hospital
Fort Belvoir

THE PLACEBO IN PRACTICE

We must beware of prescribing the placebo to please the doctor rather than the patient for a feeling that something has been done may build up to any change in symptoms and may prevent that constant alertness so necessary to good doctoring. Nevertheless there is a not inconsiderable place for the placebo in medicine and if intelligently used I will defend it to the last drop in the bottle.

A. BARHAM CARTER, M.D.

Lancet p. 823 Oct. 17, 1953

NEW BOOKS

Books received by the *U S Armed Forces Medical Journal* are acknowledged in this department. Those of greatest interest will be selected for review in a later issue.

- ATLAS OF OPERATIVE TECHNIC ANUS RECTUM AND COLON** by *Harry E. Bacon* M D Sc D F A C S F R S M F I C S F A P S Professor and Head of Department of Proctology Temple University Medical School Honorary Fellow Royal Society Medicine (England) Bordeaux and Ambroise Pare Surgical (France) Madrid and Barcelona Surgical (Spain) Piedmontese Surgical (Italy) Venezuelan Surgical Peruvian Surgical Argentinian Surgical and Proctologic Curitiba Surgical Chilean Surgical Brazilian Proctologic and Dallas Southern Clinical Societies Detroit Academy of Surgery Diplomate American Board of Surgery Member American Board of Proctology and *Stuart T. Ross* M D F A C S F I C S F A P S Attending Proctologist Nassau Hospital Mineola N Y and Mercy Hospital Rockville Center N Y Assistant Attending Surgeon in Proctology Meadowbrook Hospital Hempstead N Y Formerly Assistant Visiting Surgeon Kings County Hospital Brooklyn N Y and Lecturer in Proctology Polyclinic Medical School and Hospital New York N Y Secretary American Proctologic Society Diplomate and Member American Board of Proctology Miembro Correspondiente extranjero Sociedad Proctologia d Argentina Honorary Fellow Brazilian Proctologic Society 301 pages 403 illustrations The C. V. Mosby Co. St. Louis Mo. 1954 Price \$13.50
- ANATOMY FOR SURGEONS** Volume 1 The Head and Neck by *W. Henry Hollinshead* Ph D Professor of Anatomy Mayo Foundation University of Minnesota Head of the Section of Anatomy Mayo Clinic Rochester Minn 560 pages 326 illustrations Paul B. Hoeber Inc. New York N Y 1954 Price \$12
- THE YEAR BOOK OF ENDOCRINOLOGY** (1953-1954 Year Book Series) edited by *Gilbert S. Godan* M D Ph D Assistant Professor of Medicine University of California School of Medicine Assistant Physician University of California Hospital Consultant Endocrinologist Langley Porter Clinic of the State Department of Mental Hygiene San Francisco Calif 390 pages illustrated The Year Book Publishers Inc. Chicago Ill 1954 Price \$6
- THE HIDDEN CAUSES OF DISEASE** by *Antonio Benveniste* (1443-1502) of Florence Translation by *Charles Sigg* with a Biographical Appendix by *Esmond R. Long* 217 pages illustrated Charles C. Thomas Publisher Springfield Ill 1954 Price \$6.75
- BEYOND THE GERM THEORY** The Roles of Deprivation and Stress in Health and Disease edited by *Iago Galdston* M D A New York Academy of Medicine Book 182 pages illustrated Health Education Council New York N Y 1954 Price \$4

- PRINCIPLES OF BIOCHEMISTRY A B l g l App oach by M V T y
M A R ham d E p rime t l Sta H r p d H r t 194 pag
I l t r a t d P r i m a P b l h g C r p N w Y k N Y 1954 P \$4
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A MANUAL OF OTOTOLOGY RHINOLOGY AND LARYNGOLOGY by *Howard Charles Ballenger* M D F A C S Professor of Otolaryngology Emeritus and recently Chairman of the Department of Otolaryngology Northwestern University Medical School Chicago Ill Surgeon in Department of Otolaryngology Evanston Hospital Evanston Ill and *John J. Ballenger* M S M D Associate Department of Otolaryngology Northwestern University Medical School Chicago Ill Member of the Surgical Staff Department of Otolaryngology Evanston Hospital Evanston Ill 4th edition enlarged and thoroughly revised 365 pages with 136 illustrations and 3 color plates Lea & Febiger Philadelphia Pa 1954 Price \$6

THE CAUSES AND TREATMENT OF BACKWARDNESS by *Sir Cyril Burt* D Sc Hon Litt D Hon Ll D Fellow of the British Academy Honorary Fellow Jesus College Oxford Emeritus Professor of Psychology University of London Formerly Psychologist to the London County Council 128 pages Philosophical Library New York N Y, 1953 Price \$3 75

PSYCHOLOGY THE NURSE AND THE PATIENT by *Doris M. Odium* M A (Oxon) B A (Lond) M R C S L R C P D P M Ditt F R C S, Senior Psychiatrist Elizabeth Garrett Anderson Hospital London, Consultant Psychotherapist West End Hospital for Nervous Disorders, London 2d edition 168 pag Philosophical Library New York N Y, 1954 Price \$4 75

HOW TO CHOOSE THAT CAREER Civilian and Military A Guide for Parents Teachers and Students by *S. Norman Feingold* F I D, Executive Director Jewish Vocational Service of Greater Boston and part time Instructor Boston University Illustrated by *C. Robert Pearson* 52 pages Bellman Publishing Co Cambridge Mass 1954 Price \$1

HISTOPATHOLOGIC TECHNIC AND PRACTICAL HISTOCHEMISTRY by *R. D. Little* M D Medical Director U S Public Health Service Chief Pathologic Anatomy Service Clinical Center National Institute of Health and Chief Laboratory of Pathology and Chemistry National Institute for Arthritis and Metabolic Disorders The Blakiston Co Inc New York N Y 1954 Price \$7

A SYNTHESIS OF HUMAN BEHAVIOR An Integration of Individual and Ego Growth by *Joseph C. Sola* M A Assistant Clinical Professor of Psychology University of California Consultant Psychiatrist San Francisco Calif 265 pages Grune & Stratton New York N Y 1954 Price \$5 50

SURGICAL UROLOGY A Handbook of Operative Surgery by *John M. D. Professor and Head Department of Urology* and *John M. D. Assistant Professor of Urology State University of Medicine* Illustrated by *Paul Ve Vass* 392 pages Book Publisher Inc Chicago Ill 1954 Price \$7

ALCOHOLISM by *Jackson A. Smith* M D Director of Psychiatry Jefferson Davis Hospital Assistant Professor University College of Medicine Houston Texas Member of the Board of Psychiatry and Neurology Staff of the Hospital Methodist Hospital Hermann Hospital and Southern Pacific Hospital 72 pages Philadelphia Pa 1954 Price \$3

FLUID AND ELECTROLYTE THERAPY by *Franklin J. S. Assistant Professor of Surgery University of California* and *Horace G. Loe* M D illustrated by *J. B. Lippincott Co* Philadelphia

PHYSICAL ASPECTS OF BETATRON THERAPY by J b S Laughl

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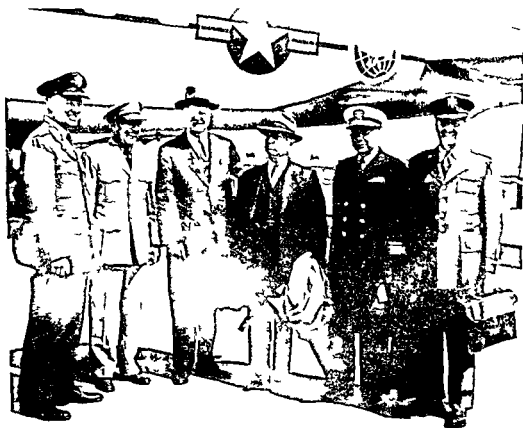
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MEDICAL REPRESENTATIVES FROM NATO COUNTRIES HOLD CONFERENCE AT SHAPE

More than 70 representatives of the medical profession from the 13 North Atlantic Treaty Organization countries attended the third Medical Planning Conference at Supreme Headquarters Allied Powers Europe, near Paris on 10-12 May 1954.



The United States delegation from Washington, D. C. in a happy mood on their arrival in Paris on 8 May via MATS where they were met by Brigadier General William J. Kenna, USAF (MC) left Chief of the Medical Branch SHAPE included: Major General George E. Armstrong, MC USA, Assistant Secretary of Defense Frank B. Berry, William S. Middleton, MD, Rear Admiral Lamont Pugh (MC) USN and Major General Harry G. Armstrong, USAF (MC).

Presentations during the conference which opened with an address by General Alfred M. Gruenther, USA, Supreme Allied Commander Europe reviewed the progress made in planning logistic support for the medical requirements of NATO. Brigadier

First row left right Maj N Gurba Turk y Maj G n. G s E Arm tr g Surg
 G ral U S. Amy Maj G G F r r D G l l l i a Amy Md l Srv
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 G n. C. R. H. F ng-Ha D G l D h j M d l Srv Maj G n.
 J T W i k D G l R y l N t h e l d Army d A F Med l Srv
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 U S N v y

Second row left right Maj G n. Da C O g l USAF (MC) R Adm. J G l y D p y
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 A y a n o g l u, nd Col R. E r g u d Turk y B g. G n. A P D R o h D M d c a l S e r v
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 S e r v i c

General William J Kennard USAF (MC) Chief of the Medical Branch SHAPE was general chairman of the meeting.

The following presentations were made by United States representatives Current Status of Antibiotics in the United States Armed Forces Major General George E Armstrong Surgeon General U S Army Health as the First Line of Defense * Rear Admiral Lamont Pugh Surgeon General U S Navy Emergency War Surgery * Brigadier General Sam F Seeley USA Surgical Consultant U S Army in Europe Report from Allied



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Command Atlantic Captain Hubert J Van Peenen (MC) USN Staff Medical Officer Atlantic Fleet, and The Problems of Medical Resupply for NATO Nations Colonel Howard B Nelson USAF (MC) Medical Branch SHAPE

Frank B Berry M D Assistant Secretary of Defense (Health and Medical) and Captain Dirk M te Groen (MC) USN Headquarters Allied Southern Forces Europe were among the discussion leaders on the first and second days of the conference respec

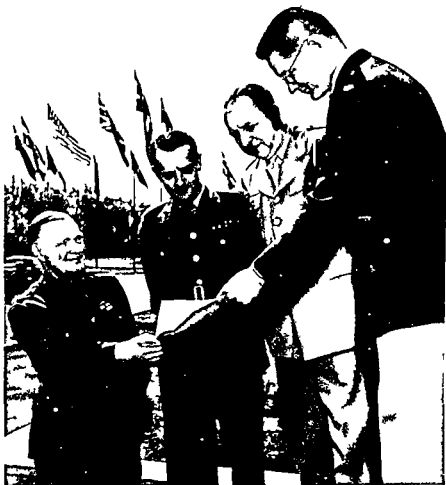
tively General Seeley's presentation constituted the progress report of the Committee of Consultant Surgeons of which he is chairman



Before a background of NATO flags Lieutenant General Asim Uca left Chief of Staff of the Turkish Air Force chats with Surgeon Vice Admiral S. Alexander Igleby-Mackenzie Medical Director General of the Royal Naval Medical Services and Colonel J. Hempel-Jørgensen Deputy Director of the Danish Joint Medical Service

Other United States delegates to the meeting included Major General Joseph I. Martin MC USA Surgeon U S Army in Europe Major General Dan C. Ogle USAF (MC) Surgeon U S Air Forces Europe Major General Harry G. Armstrong, USAF (MC) Colonel Sheldon S. Brownston USAF (MC) Lieutenant Commander Roy T. Brooks (MSC) USN and Captain Burrell W.

Wingo MSC USAR Washington D C William S Middleton
M D Madison Wis Captain Cecil H Coggins (MC) USN
SHAPE Lieutenant Colonel Sven A Bach MC USA Head



A othe group ca one f the m y doc m nt nd tudy dw g the c n-
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quarters Allied Forces Southern Europe Commander Sylvester R
Foley (MC) USN Headquarters Allied Command Atlantic and
Major Charles C Dugan USAF (MC) Headquarters Allied Forces
Central Europe

BOOK REVIEWS

A MANUAL OF TROPICAL MEDICINE by *Thomas T Mackie* M D Colonel MC AUS (R t) *George W Hunte* III Ph D Colonel MSC USA and *George B Woth* M D 2d edition 907 pages 304 illustrations 7 in color W B Saunders Co Philadelphia Pa 1954 Price \$12

This popular volume has been largely rewritten greatly extended in scope and otherwise thoroughly revised so as to present the most recent information in the field. The approach and format remain essentially the same and this is commendable. The book continues to serve as a ready resume of the salient features of the epidemiology diagnosis treatment prevention and control of what the authors deem the more important tropical diseases. The recommended therapeutic measures and methods of control of vectors and reservoirs are up to date. The manual is prepared indexed and cross indexed in such a manner that it is easy to locate desired information. There is a particularly useful section of 50 pages on laboratory diagnostic procedures and the concise summary on drug therapy of helminthic infections is most welcome.

It is unfortunate that the authors found it necessary to delete both specific documentation and a general bibliography although a list of important texts is included. It thereby is impossible to determine the source of such controversial statements as "Transmission of murine typhus from man to man by the body louse" has been demonstrated.

The authors wisely point out the need for discussion of diseases which are not limited to the tropics and have interpreted the historical term tropical medicine as in actuality meaning exotic medicine. This is obviously the basis for a sound presentation on Korean epidemic hemorrhagic fever although no mention is made of the viral and nonviral hemorrhagic fevers of the Soviet Union. At times there seems to be a disproportionate emphasis of relatively minor matters to the exclusion or limitation of material of greater interest to workers in tropical medicine.

This book presents in readily accessible form much valuable data and the illustrations tables and charts on the whole are excellent. Some of the information so graphically presented is not generally available as in the case of the excellent table on tick vectors of the spirochetes of relapsing fever. It is an extremely useful book and one which will be relied on by military and civilian scientists in the warmer climates — ROBERT TRAUB Lt Col USC USA

AN INTRODUCTION TO CLINICAL PSYCHOLOGY d d by L A P
 gt Ph D d /rw A B g Ph D 2d dit 709 pag ill
 trat d Th R nald P C mp y N w Y k N Y 1954 P
 \$6 50

This u eful work is revision of a compendium on clinical psy
 ch logy first publi h d in 1948 It ha been rewritten and bro ght up to
 date Sev ral ew chapters have been dded and old one dropped but
 many of th original writer have b en retained Extended discussi n
 ha been provided for therapy a d research b t the separate chapter
 on som tic therapies has been omitted The purpo e of the volume is
 to inform and inspire novice clinical psychologist nd to provide
 interested spec alists in assoc ted discipl nes with orientation on
 theo es and p acti es in th s science

The ed tors d sclam any def n t ve point of view even the eclect c
 ne rth le s psychoanalytic concepts permeate the theoretic material
 of many chapters and provide the r tion l f r diagnostic instrumental
 ties as well s rese rch hypotheses Th attitude toward tests par
 tic la ly the unv lid ted or proj cti e typ s i conservative w th
 emph sis on evaluatio through experimental methods well a con
 trolled empiricism Th expanded tre tment f p ychother py i n te
 worthy and pa allels the increase in magnific tion of thi fu cti n in
 clinic l p ych logy since the date of the first edition The chapters
 by W lkins nd McKinney in this ar a are exemplary of the cl rity d
 succinctness dem d in th expos t on of conceptually difficult or
 ntric te mat ri l Emphas s on problems nd hypotheses rather than
 on discrete c e r d v ces features the clinic l approach s ctioned
 by the present edition

The book may well realize the expect ti s f the editors in tim
 lating and enlighteni g th beg nng clinic l w rker well as en
 g nd i g unde stand ng and reg rd for clinical psychology mong
 adjunct scientists It w ll also prove of v l e to the mo e experienced
 w ke a a reference text n the fundamentals of h s profession The
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 venient system for either immediate or delayed reference

—ARTHUR J ORANGE Lt C I MSC USA

PREVENTIVE DENTISTRY by Jos ph C. M hl D D S Ph D M y d
 K H D D S M S d H rry G D y S D 336 p g 56 ll
 tr Th C. V M by C St L M 1954 P \$8 50

Th s te tbo k hould achieve fully its stated obj ctive to provide
 useful information on developments in those fields of science which
 c ntribute to prev ntive dentistry It has thirteen chapters The first
 d scus e the modern problem of oral disease and the es entl need
 fo preventive nd educational me sures in solving this problem Sev n
 chapte s are concerned with prevent ve considerations which rel te to
 dental c ies includ ng caries diagnosis caries activity tests im
 munizat n to c ries and an important evaluation on fluorine and car es

Instructive discussions are included on the influence of specific agents such as bacteriostatic drugs impregnation solutions the nitrofurans and vitamin K. The remaining five chapters cover nutrition a survey of dental histology pathology and calcification the dynamics of tooth tissues, the prevention of periodontal disease and the prevention of fatalities from oral cancer.

The authors have included many direct quotations from a total of 569 authors. This rather exhaustive use of the literature has been integrated effectively to produce an instructive readable and interesting textbook. Nearly every chapter has a concise summary and each ends with a full list of its reference articles. The book therefore, is of value both to readers who wish only to determine gross conclusions and to those who may desire to make a complete study of the chapter subject. Numerous tables and illustrations are included and indexing is complete with separate indexes by author and subject.

The reader who expects this book to provide definitive programs for preventive dentistry may be slightly disappointed. No fully co-ordinated program is presented. Also no material has been included on preventive dentistry possibilities in the specialties of prosthodontia oral surgery and orthodontia. It is a well written and instructive book which will prove valuable to all who are interested in the development of effective preventive dentistry. —KENNETH R. ELWELL, Lt Col USAF (DC)

CARCINOMA OF THE COLON by Leland S. McKittick, M.D. and Frank C. Wheelock, Jr. M.D. 94 pages illustrated. Charles C. Thomas Publisher, Springfield, Ill. 1954. Price \$3.25.

This small monograph is a rather complete treatise on carcinoma of the colon exclusive of the rectum. The authors have had wide experience and present their material in the conventional manner beginning with the causes of the disease and continuing with the prevention diagnosis pathology anatomy treatment operative technic post-operative care and end results including benign adenomatous polyps.

There are many outstanding features of the book for example the description of symptoms of cancer of the colon. One excellent statement pertinent to armed forces physicians is worth quoting. It is a great mistake to associate age with diagnosis of cancer. The symptoms of cancer are the same regardless of age and demand the same consideration in the young as in the old.

Much of the empirical ritual of surgical technic of the preneomycin bowel sterilization era is faithfully preserved and described. The cautery is still brandished and elaborate field and instrument quarantine procedure recommended.

Carcinoma of the colon is sufficiently common and important to justify publication of this monograph despite the lack of new or original material. —ROALD N. GRANT, Comdr (MC) USN

NEUROSURGERY OF INFANCY AND CHILDHOOD by F ranc D I gram
 M. D 456 p g 482 ill t Ch I C Th m P bl h
 Sp g l Id Ill 1954 P \$15

This is probably the first textbook of pediatric neurosurgery and is composed of an organized collection of reports from the Children's Medical Center in Boston. With the increase in neurosurgeons throughout the country more children will be treated locally by men not entirely familiar with the problem of the pediatric patient. This book may help to prevent some of the mistakes attributable to the peculiarities of children.

The book is divided into 10 parts. The first and second dealing with congenital abnormalities and hydrocephalus are excellent. These are problems most frequently encountered in children. Part three on trauma is helpful in the practical aspects of handling a patient. Parts four and five on tumors of the brain and the spinal cord are interesting and describe large series. Part six on infection presents on cerebellar vascular disorder and part eight on epilepsy are brief and to the point but not particularly enlightening. The ninth part on lead encephalopathy is good. The final section on pediatric neurosurgical anesthesia could be enlarged and should include pre and post operative care even at the expense of repeating some of the practical hints given elsewhere throughout the volume.

This book is valuable both as a reference and as a guide. It is definitely worth having and one which will undoubtedly go through several editions.—FRANK B. CLARK, Lt. Colonel (MC) USN

THORACIC SURGERY by R. b. d. H. Sw. t. M. D. 2d ed. 381 p g 1
 Illustrations W. B. S. d. C. Philadelphia P 1954 P \$10

In the second edition of this excellent work on the technique of thoracic and other related operations, the author has purposely omitted discussion of the pathophysiology of the conditions for which operation are described.

The print is larger and much easier to read than in the first edition and numerous minor changes have been made in the subject matter as well as in the illustrations. The book contains 11 chapters with 159 illustrations and describes every type of operation within the chest as well as thoracoabdominal and thorocervical operations. Only 33 pages are devoted to cardiovascular surgery but all of the accepted operative procedures in this field are described as well as most operations in the experimental or unproved stage. The author states that pulmonary and mitral valvotomy are now established procedures. The two chapters on the esophagus a subject in which the author is particularly qualified are outstanding. Although there is no bibliography the book is well indexed.

This book belongs in the hands of all thoracic surgeons, trainees in this specialty and the general surgeon who occasionally must perform thoracic operation.—SANFORD W. FRENCH, III, C. L. MC USA

CHILD HEALTH AND THE STATE by Alan Moncrieff M D 48 pages Oxford University Press New York N Y 1953 Price \$1 50

This small volume contains the Newsholme Lectures for 1953 on infant welfare school health the deprived child and parental responsibility and the state It is a scholarly treatise dealing with the omnipresent problems of child health and general welfare with particular reference to the duties and responsibilities of the State under current statutes in Britain The author points with pride to the great advances made in child health in Britain in recent years but at the same time points out the shortcomings of the program He lists the advantages disadvantages and weaknesses in the current approach to the problem and emphasizes the areas to which greater attention should be focused

—LUCIUS G THOMAS Col MC USA

JOSEPH BARCROFT 1872 1947 by Kenneth J Franklin 381 pages illustrated Charles C Thomas Publisher Springfield Ill 1953 Price \$8 50

This book gives one the pleasure of becoming intimately acquainted with that extraordinary man Sir Joseph Barcroft teacher scholar and scientist Franklin gives the reader the impression that even though personal sacrifices were required to write this biography he nevertheless considers writing it one of the most fortunate circumstances of his life

This reviewer had for several years read the scientific publications of Sir Joseph with delight and instruction and with the highest regard for their author Now after reading his biography I am even more convinced of the man's greatness In his scientific lifetime Barcroft wrote or participated in some 318 publications which are listed in order of their appearance

The book begins with an introduction which includes an interesting historical background of the Barcroft family The remainder of the book is a moving account of Barcroft's education teaching research travels and his family In his lifetime Barcroft was associated with such great men as A V Hill Lewis Starling von Frey, Krogh Pavlov Haldane Bayliss Dale and many more

Franklin uses imagination in presenting his material clearly and convincingly and holds the reader's interest throughout his presentation He recreates the essential character of Barcroft and from the various facts is able to make his readers see and understand Barcroft Barcroft never lost his gaiety or sense of humor nor neglected the religious side of his life It is amusing to note his power of mimicry and that his repertoire included an imitation of a speech by Pavlov

The book is richly illustrated with original photographs which add to its readability and is recommended for lay and professional people alike —EUGENE B KOVACIC F 1 Lt USAF (MC)

THE YEAR BOOK OF UROLOGY d t d by W H m & H Scott M D.
Ph D 375 p g Il tated Th Y Book P bl h I Ch g
Ill 1954 P \$6

The literature of interest to urologists from journals received between November 1952 and October 1953 is reviewed in the annual volume. The editor has made an excellent selection of articles which have been abstracted succinctly and in many instances are followed by valuable supplemental information. These latter data include ideas of many authors as well as additional references on the subject and the plan is commendable as well as informative.

The subject matter is covered under seven general headings: general considerations of the kidney (including a valuable section on physiology); the adrenals; ureter; bladder; prostate; and genitalia. The detailed comment including therapy with exact doses of medications used makes this book a valuable reference. The illustrations selected are the most pertinent in the articles and are a valuable adjunct to the reports.

Of special interest to urologic surgeons in the military service are the sections on fistulas and on the genitalia. Our thinking and practice on the former subject is beautifully summarized and in the latter section the subject of testicular tumors is again emphasized and summarized. The book has a splendid index both by subject and by author which is of great assistance in using it as a reference.

—EARL C. LOWRY, C. L. MC, USA

CLINICAL NEUROLOGY by B d J Alp M D S D 3d d 880
P g 243 Il ut F A D C Phil d lph P 1954

Indicative of its popularity this is the sixth printing and the third edition of this book which has appeared in nine years. The author describes his purpose as the presentation of subject of neurology in such manner as to make it intelligible to medical student and general practitioner and includes a detailed account of all the neurologic conditions encountered in practice. Many subjects have been revised to incorporate advanced knowledge. The volume is not too large, the printing is easy to read and the subjects are arranged in a logical and sequential order. A particularly valuable and unusual inclusion is the chapter "The Topical Diagnosis of Nervous Disease" which contains an excellent review of neurophysiology. There is also included a complete section on diseases of the peripheral nervous system which is all too frequently omitted in textbooks of this type. The book is well written and easily understood, the language employed is neither stilted nor pedantic. There are abundant and good illustrations but in a reference book of this type a bibliography would be most useful.

In spite of a few typographical errors and the absence of a bibliography this is an excellent book and should be a valuable addition to the library of the neurologist. It is recommended as well for all students and general practitioners. —HE RY S. COLONY, Comd (MC) USN

THE PATHOLOGY OF TRAUMA by *Alan Richards Moritz* M D 2d edition
414 pages enlarged and thoroughly revised with 126 illustrations
Lea & Febiger Philadelphia Pa 1954 Price \$8 50

This edition brings up to date a book which should be available to every medical officer. Its comprehensive coverage of nearly all forms of mechanical injury makes it an invaluable reference to the pathologist, surgeon, neurologist and internist in evaluating the medicolegal and compensatory aspects of injury. Its succinct systematic approach to the subject and clarity of presentation make for easy reading and rapid comprehension.

Because the author confines his remarks to trauma the hurried medical officer will find no help in solving problems where toxicologic aspects may be a factor and it is believed that a brief discussion of this field would increase greatly the value of this volume. Discussion of injury due to radiant energy is brief and is the only shortcoming of a book dealing so comprehensively with trauma. Of particular value is a chapter dealing with the medicolegal autopsy which should serve as a guide to any physician who might be required to perform this function. Outstanding authorities assisted in the preparation of this book. An extensive bibliography and adequate index are included.

—FRANK A. MANTZ, Jr. Lt Col. MC USA

DIE ZEREBRALE ANGIOGRAPHIE by *Hugo Krayenbühl* Professor of Neurosurgery Zurich Switzerland and *Hs R Richte* 217 pages 100 illustrations Georg Thieme Verlag Stuttgart Germany 1952

Since the invention of carotid arteriography by Moniz in 1927 increasingly more cerebral arterial and venous angiograms have been made in neurologic clinics all over the world while the frequency of pneumographic studies of the brain has declined correspondingly. Each type of neuroradiologic examination has its definite role and angiography supplements but does not supplant other diagnostic techniques.

European neurologists and neurosurgeons preceded their American confreres in widespread adoption of cerebral angiography in clinical practice. Krayenbühl was able to select illustrations for *Die zerebrale Angiographie* from more than 1 500 angiographic examinations performed on his neurosurgical service at Zurich.

Techniques characteristic vascular patterns and other details of intracranial angiography are discussed in practical fashion but it is in the clear cut photographic presentation of actual angiograms normal and pathologic that the greatest value of this volume lies. Accompanying artist's sketches point up significant roentgenographic findings.

Die zerebrale Angiographie is an interesting and informative monograph which should be in the possession of every neurologist and neurosurgeon and will be a handbook of ready and valuable reference in radiologic libraries. The illustrations format and print are attractive and readable. The text is in German. —JAMES P. MURPHY M D

ANTISEPTICS DISINFECTANTS FUNGICIDES AND CHEMICAL AND PHYSICAL STERILIZATION edited by G. G. F. R. D. H. Ph. D. 841 p. \$15
 71 II t t 130 tabl L & F b g Ph I d lph P 1954

The combined efforts of 30 contributors are assembled in this book to form a comprehensive source of pertinent information. It is arranged in an orderly manner with complete list of references for each chapter.

The book begins with a historical review of the field and definitions of terms to be used. Part II deals with methods of testing beginning with a review of early methods of testing germicides and continuing through improved test methods phenolic disinfectants chlorine compounds quaternary ammonium compounds proposed new methods for testing liquid antiseptics toxicity tests *in vivo* tests profile evaluation of antiseptics mercurials and chemical sterilization. Separate chapters give detailed descriptions of various methods of testing antiseptic disinfectants fungicides and fungistats and methods of testing chemical sterilizers and tests for sterility. The discussion of bacterial resistance and dynamics of antibacterial activity is excellent.

Many specific chemical and compounds are reviewed as to their relative effectiveness as well as various classes of preparations such as surgical antiseptics antiseptic ointments and powders and virucidal agent. Industrial preparations are discussed especially in their application to food wood cotton pulp and paper pharmaceutical and cosmetics leather paint and optical instruments. The concluding chapters deal with various methods of sterilization including a detailed explanation of the use of ionizing radiations.

This should prove a valuable book for anyone interested professionally in any phase of the subject.

—RUSSELL L. TAYLOR *Comd (MSC) USN*

UNDERSTANDING THE JAPANESE MIND by J. M. Cl. K. M. I. ney M. D. 252 p. \$3.50
 Ph I oph I L b ry I N w Y k N Y 1954 P 1

In attempting to explain individual and collective Japanese behavior through a study of Japanese culture the author has drawn together material of general as well as professional interest. His sources include works on anthropology history sociology and religion translations of Japanese psychoanalytic papers and personal conversations and correspondence with Japanese psychoanalysts. The essential question raised is whether or not the unique Japanese psychosocial institutions make it possible for Japanese psychoanalysts to free the patient from the irrational unconscious forces in his personality which prevent him from being an individual in his own right. He believes that the ancient social and political customs demand that a person be merely a kind of molecule in the national body and exist only for the greater glory of Japan.

To quote Doctor Moloney nothing at all (*mimori*) He is trained to obligate himself to his father or parent substitute emperor's way (*kodo*) He fulfill the way of the gods (his own level in society and ent to his guild (*shokumin* save face (*sekentei*) He co (an elaborate institution requ expressive of his nationalis expected of him (*jichō*) With Japanese psychoanalysts ha analysis without integrating

Among the interesting obse tinguished from Japanese psy when insane conform to author turbed women patients to behave with the concept of insanity This part by the fact that from birth males a tion toward respect for authority

on is expected to become ct authority (*kanzan*) He the father (*ko*) or to any he emperor (*chu*) or the ome a god (*kami*) or to nese he is respectful of ciates (*enryo*) and obed: ose his individuality to dividual performing *giri* e in a prescribed fashion and doing that which is the author believes that i the *technic* of psycho-

anese psychiatry as dis that Japanese men even is not uncommon for dis which is popularly associ ng behavior is explained in object to more rigid indoctrin

The book has an index and many useful references

—WARREN J. BARKER Lt Col MC USA

A PRIMER OF CONGESTIVE HEART FAILURE by George E. Burch M.D.
126 pages illustrated Charles C Thomas Publisher Springfield Ill
1954 Price \$4

This monograph consists of four chapters concerning mechanism of congestive failure its treatment digitalis and mercurial diuretics

The chapter on the mechanism of congestive failure which critically reviews the several theories and factors involved in its production is excellent The author examines each facet of the subject separately while maintaining an awareness that the whole problem thus far has defied satisfactory explanation In emphasizing fundamental and known principles the author's discussion of the overuse of mercurial diuretics particularly intravenously and his remarks on hyponatremia are conservative

Considerable detail on various digitalis preparations is given including dosage speed of action elimination and potency The discussion on the action of digitalis is somewhat brief and could be extended in future editions The chapter dealing with mercurial diuretics presents a large mass of details without the clear and cohesive exposition demonstrated in the first chapter

This is a worthwhile monograph on a complex problem It is recommended reading for the young graduate in medicine and the general practitioner and is a good review for internists

—THOMAS W. FAYON Lt Col MC USA

DERMATOLOGIC MEDICATIONS by *Alguet Rush L ne M D* d
A B nse L ne M D Ph D 183 p g ill t t d Th Y
B k P bl h I Ch c go Ill 1954 P ce \$3.50

In a concise comprehensive easy-to-use handbook the authors present a compilation of the commonly used and most effective dermatotherapeutic agents. Under each agent is given the chemical structure indications for its use mode of action dose or method of application and side effects. The agents are grouped together according to their use or action (for example chemotherapeutic agents antihistamines fungicidal and fungistatic agents and seborrheic dermatitis preparations) and are indexed both by the name of the agent and by the disease for which it is useful. The last 30 pages of the book concern therapy regimens for the more common conditions requiring progression of types of treatment. Included in this section are such entities as acne vulgaris eczema tons dermatitis psoriasis and lupus erythematosus.

This is an excellent presentation and one particularly suited for the resident in dermatology as well as for the physician who has not specialized in the field of dermatology.—RAYMOND M. WILLIAMS C L MC USA

METHOD AND THEORY IN EXPERIMENTAL PSYCHOLOGY by *Ch I E*
O g od 800 p g ill tr d O ford U ry P N w Y k
 N Y 1953 P \$10

This book written primarily for use as a text by undergraduate and graduate students in psychology is divided into four main sections. Part I deals with sensory processes of which auditory and visual modalities receive the most comprehensive treatment. Part II discusses perceptual processes in terms of perceptual organization projection dynamics and central dynamics. Part III is devoted to the literature on learning retention and transfer and part IV deals with symbolic processes under such subheadings as Problem Solving and Insight.

Thinking and Language Behavior. The remainder of the book consists of bibliography and indexes.

Rather than indulge in an exhaustive coverage of the field the author has preferred to emphasize the appraisal of selected experimental materials in relation to critical theoretic issues. For this purpose the coverage is reasonably extensive but the book's general usefulness as a text and reference may have been rendered somewhat limited by such preferential treatment. For example auditory and vision are discussed comprehensively but other modalities receive little more than token attention in a chapter on sensory quality. Similarly the devotion of more than a third of the volume to learning and memorial processes may leave the reader uninformed about the whole experimental field. Occasionally even more extensive coverage of some topics omits important contributions. For example a discussion of motor activity in relation to thought processes ignores the important work of R. C. Davis. It is difficult to imagine a reason for such an oversight.

future may still accept the efforts of these scientists as scientifically valid and worthwhile

The volume has little value for the researcher in the medical service of the armed forces but should serve its purpose rather well namely as a preface to this series and as a stimulating and provocative introduction to sociology and the other social sciences

—BLAIR H SPARKS Capt USAF (MST)

CURRENT THERAPY 1954 edited by H and F C M D 898 pages W B Saunders Co Philadelphia P 1954 P \$11

This is the sixth edition of an annual publication designed to bring to the physician authoritative current methods of treatment in a readily available form. It is limited to therapy and no diagnostic discussions are included. The discussions are written by 385 well qualified contributors actively engaged in treating the diseases of which they were evaluating the drugs described.

The inclusion of recent advances in therapy as well as long tested therapeutic regimens provides the reader with a balanced viewpoint of the present-day approach to the therapeutic management of the patient. In many instances more than one method are presented for the treatment of a specific disease representing different views of therapy or different conception of the disease.

This volume is highly recommended as a ready reference for the busy practitioner —JOHN T B STRODE Col MC USA

PRINCIPLES OF BIOCHEMISTRY A Biological Approach, by A L Tcey
M A 194 pages illustrated P m n P blish g Corp N w York N Y
1954 P c \$4

This book re-emphasize that biochemistry is a biological science and must be considered from the point of view of the cell and its environment. It is divided into three parts. The first concerns the biochemical organization of the cell and the systems which support the life of the cell the second discusses the cell its environment and the systems which enable it to adjust to the environment and the third deals with those factors which are the cause or result of the difference in life between animal plant and micro-organisms. The author continually stresses the similarity between the three major categories of living systems.

The volume is small and the subject is large. Only the major highlights are brought out and the fine detail or fact or the support of controversial statements is left to the reader to obtain. A more extensive bibliography particularly in reference to main subject headings would have been helpful —IRVING GRAY Lt Col MC USA

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1. Young, M. Y., Suelzer, J. and Rose, A. J. F. Penicillin treatment of blood stream after various doses of penicillin by various routes. *Am J Surg* 61-64 Nov 11 1944.
2. I. C. Pernicious and secondary anemia, chlorosis and leukemia. *Old World (doctor) Med and Medicine* 3d edition. Lea & Febiger Philadelphia Vol 2 pp 33-100.

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WASHINGTON 1954

FOREWORD

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Monthly Message

A few words about débridement of wounds. Guns and pellets of shot were mentioned by John of Arderne (1370) and Chaucer (1389). The latter was a friend of John of Gaunt and the former was a surgeon with a large practice among the nobility. In the *Canterbury Tales* John of Gadsden is presumably the doctor in the *Doctors Tale* but it could well have been John of Arderne of fistula fame. The first surgeon to describe gunshot wounds however was Hieronymus Brunschwig in 1497. Then and until the time of Paré 30 years later these wounds were considered to be poisonous. Brunschwig prescribed drainage as the initial treatment, much as at the beginning of World War I.

In 1566 however Thomas Gale an Elizabethan

surgeon wrote

Now seeing (as I suppose) I have sufficient
the shot or powder to be venomous it is
the methodicall cure of these kindes of wounds
two intentions properly hereunto
the wound of all such things
The other is restoring of
I call things not agreeing
splinters or shivers of wood
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NONGONOCOCCIC URETHRITIS IN THE MALE

PAUL S PARRINO *Lieutenant Colonel MC USA*

ABOUT two years ago I became interested in the large number of men referred to the venereal disease clinic for urethritis in whom the gonococcus could not be demonstrated, and in the unsatisfactory treatment methods then in use

MAGNITUDE OF THE PROBLEM

From 1 July 1952 to 31 December 1953, 4,555 patients were referred to the venereal disease clinic of this hospital. Of these 3,409 (74.8 percent) had urethritis, 40, syphilis, 73 chancroid, and 23 had lymphogranuloma venereum. The remaining patients were divided between those who were diagnosed as having balanitis, verruca acuminata, herpes, or other nonvenereal lesions of the genitals, and those in whom the evaluation of blood serologic reactions was doubtful. Of the 3,409 patients with urethritis, 1,736 proved, by smear and/or culture, to be due to the gonococcus and 1,673 (49 percent) could be classified as nongonococcic urethritis or nonvenereal urethritis. In the absence of precise definitions in Department of the Army Circular 87 for nongonococcic urethritis and nonvenereal urethritis, the diagnosis of nongonococcic urethritis was made in all instances in which the patient admitted sexual contact within 30 days of the onset of the first symptoms without the use of prophylaxis. Using these criteria, 95 percent of the patients in whom the gonococcus was absent were classified as having nongonococcic urethritis and five percent as having nonvenereal urethritis. In this study there were no significant differences in the patients' symptoms or the response to treatment in these two groups. Throughout this article the term "nongonococcic" will be used to designate both types. All types of nongonococcal urethritis have been described by Harkness. In addition to the types mentioned above, about 25 percent of the 1,736 patients treated for gonorrheal urethritis showed a primary mixed infection by gonorrheal and nongonorrheal organisms on their first visit to the clinic.

The discussion of the magnitude of the problem and racial distribution of cases deals with 1,736 patients seen between 1 July 1952 and 31 December 1953. All other studies are based on

1 277 patients seen between 1 July 1952 and 30 June 1953. The number of patients involved is stated in each table. The varying number of patients is dependent on the completeness of information on the particular item.

EPIDEMIOLOGY OF NONGONOCOCCIC URETHRITIS

Racial distribution of patients. An analysis of the racial distribution of cases of gonorrhea and of nongonococcic urethritis in which racial data were stated revealed the following results. Of 1 736 cases of gonorrhea 78.1 percent occurred in Negroes and 21.9 percent in white men. By contrast of 1 488 cases of nongonococcic urethritis 50 percent occurred in white men and 50 percent in Negroes. In the absence of accurate population statistics by race for this camp during the period of this study specific racial rates were not calculated; however studies are being continued to determine the validity of the apparent relatively higher ratio of white men to Negroes for nongonococcic urethritis. Wagner and associates found that, of their 84 patients 69.1 percent were white and 30.9 percent were Negroes; however the racial distribution of the population from which these patients were drawn is not stated.

TABLE 1 Age distribution of patients with urethritis

Age (year)	Urethritis	
	No gonococcal (661 patients)	Gonorrheal (1 172 patients)
	Percent	Percent
17 to 19	5	9
20	11	16
21	13	17
22	15	18
23	16	12
24	17	10
25	7	6
26 to 32	13	10
Above 32	3	2

Age distribution of patients. Table 1 shows the age distribution of 661 patients with nongonococcic urethritis as compared with the age distribution of 1 172 patients with gonorrheal urethritis. Seventy-seven percent of the patients with nongonococcic urethritis and 62 percent of the patients with gonococcal

urethritis were between the ages of 17 and 24 years. In the absence of specific data regarding the ages of the entire population of this camp, no comment is offered on the slight difference in the average age of the two groups.

TABLE 2 *Time between last sexual intercourse and onset of symptoms in 1 000 patients with nongonococcic urethritis*

Time (days)	Patients (percent)
1 to 3	8
4	10
5	6
6	4
7	6
8	6
9	6
10	4
11 to 15	13
16 to 20	7
21 to 30	12
30 to 90	12
Over 90	6

Venereal history The question of whether or not nongonococcic urethritis is a venereal disease has received considerable attention in the literature within the past two or three years. Almost all writers believe that in most cases the disease is sexually acquired and much evidence of its transmission has been recorded. Table 2 gives the time between the last sexual intercourse and the onset of symptoms in 1 000 patients with nongonococcic urethritis treated in this clinic. The data reveals that 94 percent of the patients admitted having sexual contact with women within three months of first reporting to this clinic. Many patients stated that symptoms of urethritis started a few days after the last sexual intercourse. Also, in a large percentage of the patients gonorrhea was acquired following the last sexual contact and a residual urethritis followed as a sequel. Less than one percent of the patients denied having sexual intercourse within a year when reporting for treatment. Eighty-two percent of the patients with nongonococcic urethritis admitted having sexual contact within 30 days of the onset of symptoms.

Use of prophylaxis during exposure During the first interview about one out of three men with nongonococcic urethritis stated they used mechanical or chemical prophylaxis during or after their last intercourse however, on further questioning only rarely could a substantial story for the actual or correct employment of a prophylactic method be sustained

Geographic location of contacts The last sexual contact for 27 percent of the men took place in New York City for 13 percent in New Jersey for 52 percent in one of 31 different states in the United States and for eight percent in such foreign countries as Germany France Austria Japan Korea and Mexico

Time lapse between last sexual intercourse and onset of symptoms In an attempt to establish whether or not nongonococcic urethritis is a communicable disease and if it is contracted during sexual intercourse incubation periods were calculated on the basis of the number of days elapsing between the last admitted sexual contact and the beginning of symptoms When this was less than five days a history of other contacts prior to the last were frequently obtained however for the purpose of uniformity all periods were calculated from the date of last exposure Table 2 based on an analysis of 1 000 patients shows the calculated incubation periods It will be noted that in 50 percent of the patients the last sexual contact occurred within 10 days of the appearance of the first subjective symptoms in 63 percent it occurred within 1 days and in 87 percent within 0 days In the remaining 18 percent of the patients the last exposure occurred from one to eight months previously The latter group represented a large proportion of the patients in whom the last exposure resulted in the development of gonorrhea with nongonorrheal urethritis following immediately after treatment for gonorrhea or after a lapse of several days or weeks It is believed that some of the patients who denied intercourse within the last three months were not giving correct histories

CLINICAL MANIFESTATIONS

Previous history of gonorrhea Forty five percent of all the patients who had nongonococcic urethritis admitted having gonorrhea at some prior time

Duration of symptoms Table 3 shows the duration of symptoms given by 872 patients at the time of their first visit Five patients had had symptoms intermittently for over a year and in one patient symptoms and treatment extended intermittently for four years Most of those having symptoms for over a month had been treated previously at other installations many patients giving a history of more than 10 series of various treatments

Consequently, in addition to any other classification of non gonococcic urethritis a division into acute and chronic must be made. In this clinic, those infections of 30 days' duration or less have been arbitrarily classified as acute, and those of over 30 days' duration as chronic. Such a classification is important in determining the type of treatment indicated, the prognosis for cure, the development of complications, and the basis for referral of patients to the urologist. It is my belief that chronic infections usually involve complications and should be treated by a urologist. This clinic renders only medical treatments; no urethral instrumentations are performed. Prostatic examinations are made only when indicated to determine if complications are present which require the attention of the urologist. Using the criterion of 30 days' duration, it will be seen that the infection of 82 percent of our patients can be classified as acute.

TABLE 3 *Duration of symptoms in 872 patients*

Time (d ys)	Pat ents (percent)
1	28
2 to 5	40
10 to 20	10
21 to 30	4
Over 30	18

Previous treatment received The histories of 426 patients who had received previous treatment showed that 90 percent had received penicillin intramuscularly, six percent had received sulfadiazine and three percent had received aureomycin hydrochloride. A few patients had received streptomycin, oxytetracycline (terramycin) or chloramphenicol and many had received numerous prostatic massages. Most of this group of patients had received two or more different drugs and several had received five or six. Those receiving penicillin had received up to 20 injections. Because 90 percent of the previously treated patients had received penicillin with no relief it is apparent that in non gonococcic urethritis the organism is penicillin resistant.

Precipitating factors In addition to the high percentage of patients who admitted recent sexual contact, the frequency of two immediately precipitating factors was impressive, namely excessive sexual activity and bouts of heavy drinking of alcohol. Many men gave histories of daily sexual activities over a period of several days with three or more exposures a day. Alcoholic

bouts consisted of unusually heavy drinking on a single day or of more than average drinking over a period of several days. Further studies with controls are planned to determine if the sex and drinking habits of the average man differ significantly from patients with urethritis. Milking of the urethra after each urination is also a frequent precipitating factor. It is done by men who have exposed themselves without protection and who fear they have contracted a venereal disease. This procedure becomes a veritable compulsion especially in the married man who has just returned from overseas and fears he may infect his wife. This manual manipulation produces a traumatic urethritis on which the normal saprophytic flora of the fossa navicularis may produce a purulent exudate. A case of traumatic urethritis was caused by the rough manual manipulation of the patient's penis. Patients attributed the onset of urethritis to various forms of unusual physical exertion, constipation or to an upper respiratory infection. During the winter months many patients concurrently had developed urethritis and upper respiratory infection. No comment is offered at this time as to a possible causal relationship although Eisendrath and Rolnick stated that acute catarrhal nongonococcal urethritis with a mucopurulent discharge is usually associated with catarrh of the upper respiratory tract. Keyes and Ferguson stated that gonococci, sexual indiscretion and the tight anterior urethra or meatus are the usual causes for prolonged simple urethritis and that urethritis due to sexual excesses is primarily a prostatitis.

SYMPTOMATOLOGY

The subjective symptoms reported by patients were various types of discomfort and pain in the urethra, glans, testicles, perineum and inguinal regions. A difference in the symptoms were reported by patients with nongonococcal urethritis and those infected with the gonococcus, whereas in patients with gonorrheal urethritis the predominant symptom was a burning sensation in the urethra during urination, only a small percentage of patients with nongonococcal urethritis reported this symptom. The most frequent sensation reported by the latter group of patients was an itching or tickling in the urethra. This symptom is almost pathognomonic of nongonococcal urethritis and when a patient with a profuse purulent discharge is first seen the type of urethritis can be predicted with a high degree of accuracy on the basis of the urethral sensation alone. Harkness quotes Bockhart who in 1886 experimentally produced nongonococcal urethritis and reported that itching in the urethra occurred 24 hours after inoculating the volunteer's urethra with staphylococci cultivated from the wife of a patient with urethritis. Other patients described the urethral sensation as stinging, smarting, scraping, burning and irritation. Although most patients com-

plained of discomfort during micturition a considerable number reported symptoms independent of urination. These were sensations of discomfort, most frequently referred to the glans, meatus, and fossa navicularis. Patients used such terms as "a pinching at the end of the penis," "pain and soreness at the end of the penis," "pain in G string after urination" or "slight burning inside the tip." A frequently reported symptom was difficulty in starting urination with a sudden release of urine as though a temporary obstruction was relieved. The number of patients who reported vague discomfort in the groins, testicles, and perineum was impressive. Also, 10 patients experienced frank pain and tenderness in the testicles and five of these developed epididymitis. Three patients had terminal micturition hematuria prior to treatment.

DIAGNOSIS

Three types of urethral discharge were noted (1) frankly purulent which was usually profuse (2) mucopurulent in which the mucus was usually flecked with pus and (3) a thin watery discharge. In addition, several men were referred to this clinic with urethrorrhea (an excess of normal mucus). However this is usually due to milking the urethra and if the milking process is continued a traumatic urethritis will develop. Many patients referred for treatment of a urethral discharge had only a phimosis and a balanitis, or an infected condyloma acuminatum. Proper cleansing and irrigation of the preputial sac revealed no discharge coming from the urethra. The patient with the usual acute infection (of less than 30 days duration) of nongonococcic urethritis had a profuse purulent discharge grossly indistinguishable from that of gonorrhea; some however had only a watery or mucopurulent discharge. In general, the patient with a chronic infection (over 30 days) presented a watery or mucopurulent discharge. The majority of patients with this condition gave histories of having had a "milky" discharge at the beginning of the disease or at some time during its course. Many patients with a chronic infection reported intermittent changes in the character of the discharge—from purulent to mucopurulent to watery and again to purulent. These changes were usually observed after varying treatments which gave temporary relief but with subsequent relapse. In the latter type of patient the problem of reinfection must be considered.

MICROSCOPIC FINDINGS

Early in this study every precaution was taken to avoid confusing gonorrheal with nongonorrheal urethritis. Smears and cultures both on blood agar and chocolate agar were made. The accuracy of the smears in our laboratory was so high that routine cultures were eliminated and the diagnosis of nongonococcic ure

thrititis was made on the basis of the absence of the gonococcus in smear preparations. In this clinic about 25 percent of all patients treated for gonorrheal urethritis showed initially a mixed infection. Because the technicians were not experienced in finding inclusion bodies of abacterial urethritis or in cultivation of pleuropneumonia like organisms these organisms do not appear in the list of microscopic findings. The 21 percent of the smears showing pus and epithelial cells but no organisms were from urethral discharge which usually showed no growth on blood agar or chocolate agar and conceivably could be due to either virus or pleuropneumonia like infections. The predominating organisms in the urethral discharge of 1 277 patients were various gram positive cocci (usually hemolytic and nonhemolytic *Micrococcus pyogenes* var *albus*) and gram positive bacilli (usually reported as diphtheroids) (table 4). These organisms are

TABLE 4 Organisms in the discharge found by direct method
1 277 patients

Organism		Patient (percent)
Gram-positive cocci		9
Gram-positive diphtheroid (usually)	and gram-positive bacilli (usually)	55
Pus with few epithelial cells and no organisms		15
Few epithelial cells with few pus cells and organisms		6
Mucous	organisms	15

frequently found in the normal flora of the male and female genital tract. The fact remains however that in urethritis these organisms are more numerous. Further study is needed to determine to what extent a patient's own saprophytic organisms may become pathogenic or whether or not the pathogenic organism is transferred from the woman during intercourse. Among these various nongonorrheal species of neisseria such as *Neisseria catarrhalis* members of the *Escherichia coli* group *Aerobacter aerogenes* *Alcaligenes* species *Streptococcus viridans* *Micrococcus pyogenes* var *aureus* and proteus species were found. No attempt is made to ascribe causative roles to any of these organisms and further rigidity controlled studies by qualified bacteriologists are planned.

TWO-GLASS URINE TEST

The most frequent finding in this test showed the first glass to be cloudy with many large shreds and the second glass clear with no shreds. Thus this test indicated that in most of the pa-

tients the infection was limited to the anterior urethra. The two-glass test was a rapid and valuable method of observing the progress of treatment.

SENSITIVITY STUDIES

Nine hundred and thirty one sensitivity studies were performed on organisms isolated by culture from 452 patients with nongonococcic urethritis. All organisms isolated were tested for sensitivity to penicillin, 400,000 units of penicillin G procaine and 0.5 gram of dihydrostreptomycin sulfate (combiotic aqueous suspension), and oxytetracycline. The sensitivity of a smaller number were tested with aureomycin hydrochloride.

Some of the results of the sensitivity studies are difficult to interpret when compared with the therapeutic results obtained in patients with the same antibiotic. In the sensitivity tests on 10 different types of organisms isolated it was found that 95 percent of all strains were sensitive to combiotic, 84 percent were sensitive to oxytetracycline, and 80 percent were sensitive to penicillin. An analysis of results showed that usually if an organism is sensitive to oxytetracycline it is very sensitive and therapeutic results usually confirmed this by a rapid clearing of symptoms. The best results were obtained with combiotic; no strains of nonhemolytic staphylococcus and only six percent of the other organisms were resistant to it. The clinical results confirmed these findings and combiotic was the best single therapeutic agent for acute infections of nongonococcic urethritis. The sensitivity tests to penicillin were misleading. While about 80 percent of the organisms showed some sensitivity to this antibiotic, clinically penicillin alone was the poorest of all therapeutic agents tried. These paradoxical results are amplified when it is considered that 90 percent of the patients who had received prior treatment had been given penicillin with no curative results. Because most of the patients with nongonococcic urethritis had a mixed infection, clinical results apparently depended on the sensitivities of all organisms in a particular patient to the therapeutic agent used. The fact that 26 percent of all strains of diphtheroids showed resistance to penicillin and only three percent were highly sensitive to this antibiotic tends to substantiate this assumption. Wagner's² statement, "apparently the clinical response bears no relationship to the organisms isolated initially," is in accord with some of these findings.

PRELIMINARY EVALUATION

In this study, success in the treatment of patients with nongonococcic urethritis depended on the preliminary evaluation of three factors: (1) the duration of the symptoms, (2) the character of the discharge, and (3) history of predisposing and especially

TABLE 5 Summary of treatment results 977 patients

A b	Number treated	Cured		Improvement		Unimproved	
		Number	Percentage	Number	Percentage	Number	Percentage
Penicillin	50	12	24	6	12	32	64
Sulfadiazine	50	18	36	12	24	20	40
Dihydrostreptomycin	30	12	40	6	20	12	40
Oxytetracycline	55	46	84	5	9	4	7
Oxytetracycline orally	42	36	86	3	7	3	7
Combination with fluoroquinolone	250	168	67	75	30	7	3
Combination with fluoroquinolone	500						

Standard used for comparison p < 0.05

the precipitating factors, such as excessive sexual activity alcoholic drinking, and "milking" of the urethra

A patient with such a history requires no medication if he has only a watery or mucoid discharge which on smear shows epithelial cells predominating with a few pus cells and a very few or no organisms. In such cases the patient should be instructed to avoid alcohol, sexual activity, eating highly seasoned food and "milking" of the urethra. If the patient follows these instructions, his symptoms should subside in from three to five days. This is in consonance with Logue and Bird.⁵ In some patients, however the discharge becomes mucopurulent or purulent, and medication is required.

Patients with acute infection responded more rapidly to treatment than those with a chronic infection.

In the evaluation of therapeutic results (table 5) conclusions are necessarily limited by the relatively short follow up period possible at a camp such as this one, where the majority of patients treated are transient personnel. The factor of reinfection also makes appraisal of treatment results more difficult.

TREATMENT

Penicillin Despite the fact that about 90 percent of the patients in this series had been previously treated with penicillin without lasting result, we tested the efficacy of this antibiotic on 50 patients with new acute infection of nongonococcic urethritis administering 600 000 units of penicillin G procaine in oil with 2 percent aluminum monostearate every 48 hours for two or three doses. As was the experience of Crouch and associates,⁶ Graham,⁷ and Babione and Graham,⁸ it became apparent very early that penicillin was of little value and 75 percent of the patients treated with it required retreatment with combiotic or oxytetracycline. In general this is in accord with the experience of Logue and Bird. A few patients were made worse in that a watery or mucopurulent discharge was converted into a profuse purulent discharge while penicillin was being administered. Three patients hospitalized for other conditions developed a urethral discharge while taking penicillin for a nonurologic disease, a development also described by Graham.⁷ Logue and Bird also reported that a persistent nongonorrheal urethral discharge developed while several patients were receiving penicillin for gonorrhea.⁹

Sulfadiazine Experience with sulfadiazine was likewise very disappointing. Using this drug on an outpatient basis, the physician cannot be assured that the patient is taking the drug as prescribed. I believe that many patients' failure to take sulfadiazine tablets or oral antibiotic capsules as prescribed stems

from their disappointment at not receiving a parenteral injection.

Dihydrostreptomycin Better results were obtained in patients treated with dihydrostreptomycin alone than with penicillin but were found to be very inferior to combiotic

Oxytetracycline Ferguson and associates reported the value of urethral instillations of oxytetracycline in chronic urethritis. Although their report concerned chronic urethritis a series of patients with either acute or chronic nongonococcal urethritis were treated by instillations. At first a 2.5 percent solution of oxytetracycline intravenous in normal saline was used for instillation into the urethra but because of the discomfort felt by some patients the strength was reduced to 1.5 percent with good results. When oxytetracycline instillations were effective the average number of daily treatments was five. Because of the time required for preparation of the solution and for holding the solution in the urethra this procedure was reserved for the more chronic infections when combiotic was found so efficacious in acute cases. About 25 percent of the patients given such instillations developed a mild hematuria during the course of treatment. These patients usually had complications which necessitated referral to a urologic clinic. Oxytetracycline by oral administration of 250 mg. every four hours for from five to seven days was also found to be effective. The medication was usually discontinued in those patients developing gastrointestinal symptoms. The present policy is to use oxytetracycline orally for patients with chronic urethritis and in those with acute urethritis when combiotic fails.

Based on sensitivity studies and the work of Leberman and Morton oxytetracycline has proved effective against almost all organisms found in nongonococcal urethritis.

Combiotic Combiotic aqueous suspension is a ready mixed product containing in each 2 cc. dose 400,000 units of penicillin G procaine and 0.5 gram of dihydrostreptomycin sulfate for intramuscular injection. The synergistic action of penicillin and dihydrostreptomycin in this preparation far exceeds the efficacy of either antibiotic alone. This is borne out by studies of clinical failures with the latter two antibiotics when used separately and the uniformly good results obtained with combiotic. Because of results obtained in 750 patients with nongonococcal urethritis and 300 patients with mixed gonorrheal infections combiotic is considered the treatment of choice for all patients with acute nongonococcal urethritis and mixed gonorrheal infections regardless of the laboratory findings. The more purulent the discharge and the more recent the infection the more rapid was the disappearance of symptoms. Optimum dosage was found to be two daily

doses of 4 cc given intramuscularly (equivalent to 800 000 units of penicillin G procaine and 1 gram of dihydrostreptomycin sulfate daily) A few patients required a third dose and it was found that if three doses did not produce results neither would a larger number In most patients, the urethral discharge stopped completely within 24 hours following the first injection Only one reaction (urticaria) was encountered in more than 1,000 patients

FOLLOW UP STUDIES

Combiotic-treated cases without follow-up Due to the transient nature of the patients accurate long follow-up periods were not possible In one large group of patients no follow up was possible but I believe that failure to report for checkup was significant In this group of 500 patients with acute nongonococcal urethritis, usually with a profuse purulent discharge one dose of 4 cc of combiotic was administered and the patient advised to return in from one to three days for checkup None of the 500 returned and this was interpreted to mean that the symptoms in most of these patients had stopped with one treatment because a man with a persistent urethral discharge pain and discomfort is usually anxious to obtain treatment as long as the symptoms continue When follow up was possible and the discharge did not stop within the first day the patient continued to return until cured The assumption that these patients were cured was substantiated when an analysis revealed that most of them were scheduled for overseas shipment A man scheduled for shipment will usually make every effort to obtain a cure or relief from his symptoms before going overseas A few of the 500 patients received orders transferring them from this camp before their next scheduled return to the clinic but in most cases these men were still in camp and could have reported for a checkup Those of this group who were scheduled for separation from the service at this camp did not have an urethral discharge when they appeared for a final type physical examination or they would have been referred back to this clinic

Combiotic treated cases with follow-up Two hundred and fifty patients with nongonococcal urethritis were observed (for periods of from four to 30 days following treatment) twice weekly and it was found that 66.4 percent of the patients were completely cured and 30.0 percent were greatly improved No change occurred in 2.6 percent of the patients and 0.8 percent became worse If all patients could be observed for longer periods, it is believed that the percentage of complete cures would be much higher In those patients who showed no change or became worse referral to a urologic clinic revealed prostatic involvement or other complications

COMPLICATIONS AND ASSOCIATED PATHOLOGY

Prostatitis was the most frequent pathologic condition associated with nongonococcic urethritis especially in those patients in whom the duration of symptoms existed more than 30 days before reporting for treatment. Five patients with acute epididymitis were seen from whom smears and cultures were negative for the gonococcus. The five were hospitalized and treated with combiotic and received prompt and complete cure. Three patients had hematuria prior to treatment. Many cases of nongonococcic urethritis were seen in association with other infections such as balanoposthitis, verruca acuminata and chancroid.

Unknown factors in nongonococcic urethritis requiring study
The most important question from the point of view of preventive medicine is which cases, if any, of nongonococcic urethritis are sexually acquired. A survey of the urologic and gynecologic literature reveals evidence which strongly supports the view that a large proportion of infections result from sexual intercourse. Curtis and Huffman, in their chapter on nonspecific infections, stated that many women with urethral or cervical discharge acquire the infection by sexual contact with men suffering from postgonorrheal urethritis. They have isolated essentially the same types of organisms from women that have been isolated from men in this study.

Herman believed that in men the most frequent source of urethritis due to the staphylococcus group is intercourse with a woman suffering from a leukorrheal discharge, a condition which seems to be especially infectious to men. Harkness cited abundant evidence for the natural and experimental transmission of these infections.

Patients with chronic nongonococcic urethritis are concerned about sterility. In this regard, Harkness reported that he isolated *L.* organisms in both men and women during investigations for sterility.

Investigation is needed to determine to what extent women harbor the various types of nongonococcic organisms in the genitourinary tract and under what conditions these organisms produce disease.

Because various species of staphylococci are present in this disease which is very prevalent, the possibility of these organisms serving as the causative agent for staphylococcic food poisoning arises. Toxicity studies should be made on strains of staphylococci isolated from patients with nongonococcic urethritis in an attempt to determine the enterotoxin-producing ability and potential ability to cause food poisoning. If the

staphylococci found in urethritis do produce enterotoxin, then it is more important to prevent patients with this disease from working as food handlers than it is those with gonorrhea. Anticipating this possibility, patients were instructed to avoid food handling.

Primary mixed infections by gonorrheal and nongonorrheal organisms An adequate study of nongonococcic urethritis cannot be made without a consideration of mixed infections in which besides the gonococcus, the same types of organisms found in nongonococcic urethritis are found in smears and cultures. This is especially true of staphylococci found in association with the gonococcus. Because 45 percent of the patients with nongonococcic urethritis gave a history of previous gonorrheal infection the role of the latter infection in nongonococcic infections was investigated. All patients with gonorrhea were studied three days after treatment. The smears in about 25 percent of these patients were then negative for gonococci but a urethral discharge in which gram positive cocci and bacilli were found in large numbers continued. Retreatment with penicillin did not eliminate this type of discharge. However, treatment with combiotic or orally administered oxytetracycline caused the disappearance of the gram positive cocci and a clearing of the symptoms.

The laboratory was then requested to give a complete reading of all smears positive for the gonococcus and to include a description of all organisms found and their relative proportion as compared to the gonococci. All smears showing a large percentage of organisms other than gonococci were defined as showing primary mixed infections by gonorrheal and nongonorrheal organisms. The importance of this study lies in the fact that if all patients with gonorrhea showing a mixed infection at the first visit are treated initially with combiotic, very few will require further treatment. Studies are being continued to determine the minimum percentage of nongonorrheal organisms which must be present to justify a diagnosis of a mixed infection. A large proportion of all patients with gonorrhea will show some mixed organisms. My general impression is that those patients showing somewhere between 25 and 50 percent of nongonorrheal organisms require retreatment when penicillin alone is used. I believe serious consideration should be given to the use of combiotic instead of penicillin in the initial treatment of all patients with gonorrhea. This procedure would prevent most patients from developing postgonorrheal urethritis.

Administrative consideration of nongonococcic urethritis The incidence of nongonococcic urethritis, when compared to that of the five reportable venereal diseases, does not show the over all

importance of the disease. It is paradoxical that gonorrhea and syphilis which before the introduction of antibiotics required much of the time and expense of medical treatment facilities are now relatively simple problems. By contrast nongonococcal urethritis is a major problem because of (1) the large number of previous treatments reported by patients with chronic urethritis (2) the cost of large quantities of expensive antibiotics and other drugs used (3) the unsatisfactory results of treatment of patients with chronic infections and (4) the mental attitude developing in patients as a result of the prolonged course of treatment and the uncertainty of cure in many cases.

Wagner and associates confirm the last point in stating that the syndrome of nongonococcal urethritis is often made worse by certain mental states. The emotional component of this disease is manifested in several ways. A patient becomes anxious when told that although he does not have a venereal disease there is no assurance of a rapid cure. An outstanding symptom of this anxiety is the constant milking of the urethra to note the progress of the disease thus traumatizing the mucosa and aggravating the infection. A severe form of anxiety associated in some instances with a mild form of depression is frequently seen in the married man with this disease especially if he has just returned from overseas and he fears the consequences of returning to his wife with urethritis. Such a patient expects positive answers to his questions regarding the infectiousness of the disease the probability of producing sterility in either himself or his wife the development of impotency the effect on his general health the duration of the disease et cetera.

Because there are several different diseases under the heading of nongonococcal urethritis uniformity in diagnosis is needed. It is urgent that definitions be established for (1) each type of the disease (2) the criteria for labeling an infection acute or chronic and (3) the criteria for determining whether or not it is of venereal origin. To determine this investigation of the sexual contacts of patients with nongonococcal urethritis should be started on a pilot basis in one or more localities where good co-operation of the local health authorities can be assured.

SUMMARY AND CONCLUSIONS

Nongonococcal urethritis is an important problem at this camp which as a personnel processing center handles large numbers of transient personnel. It required more medical attention than the five usual venereal diseases. No direct evidence is offered to substantiate nongonococcal urethritis as a venereal disease in fact adequate proof that all types of this ailment are infectious diseases is still lacking.

Epidemiologic studies show that there is an apparent racial difference in the incidence of this disease white men showing a relatively higher ratio than Negroes in contrast to the reverse incidence of gonorrheal urethritis. Seventy-seven percent of 661 patients were between the ages of 17 and 24. Ninety-four percent of 1 000 patients admitted sexual intercourse within three months of the onset of their symptoms and the places of their last sexual contact were located in 7 states and six foreign countries. The time elapsing between the date of the last sexual intercourse and the onset of symptoms was less than 10 days in 50 percent of these patients and less than 30 days in 82 percent.

Forty five percent of all patients with non-gonococcic urethritis admitted having gonorrhea at some prior time and the latter disease appears to be a prominent predisposing factor in one type of the ailment. Precipitating factors were excessive sexual activity, excessive drinking of alcoholic beverages and "milk ing" of the urethra.

In 82 percent of the patients with infections classified as acute symptoms were present for less than 30 days before reporting to the clinic. In 18 percent, symptoms were usually present for from one to three months or longer and the infections were classified as chronic.

Of those patients who had received treatment prior to reporting to our clinic 90 percent had received penicillin without curative results.

The most prominent subjective symptom reported was a tickling or itching sensation in the urethra. The urethral discharge was usually profuse and purulent in the patients with acute infections and mucopurulent or watery in those with chronic infections.

Several types of micro-organisms were found on smear and culture the most frequent being hemolytic and nonhemolytic *M. pyogenes* var *albus* and diphtheroids. Further study is needed to determine which types are acquired and which types cause autogenous infection. In 21 percent of the patients, no organisms could be found.

Sensitivity studies to antibiotics are confusing and do not parallel therapeutic result.

The treatment of patients with acute nongonococcic urethritis is a great deal more satisfactory than treatment of those with the chronic type. It is believed that the marked difference between the two groups is due to the frequency in the chronic type of complications and associated pathologic conditions—especially prostatitis. Combiotic produces excellent results in the treat-

ment of patients with the acute form. In chronic infections the best results were obtained with oxytetracycline given orally or by urethral instillation. The study of primary mixed infections with gonorrheal and nongonorrheal organisms suggests the revaluation of penicillin in the treatment of gonorrhea. The initial use of combiotic in mixed infections was found to eliminate both infections in a greater proportion of patients than did penicillin alone.

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CANCER OF THE STOMACH

What is the curability of gastric cancer? The question is of some importance to mankind in view of the fact that among malignant diseases stomach cancer still remains one of not the chief cause of death. Figures from Great Britain reveal that 14,409 deaths due to stomach cancer were reported during 1952 for an estimated population of 43,940,000. These figures are in line with the estimate that 40,000 people die of cancer of the stomach each year in the United States. The magnitude of the problem demands serious thought and action on the part of every physician.

—EDWARD E. MASON, M.D.

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UNDERSTANDING THE "FEAR OF FLYING" SYNDROME

II Psychosomatic Aspects and Treatment

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IN any discussion of the effects of fear and anxiety on human behavior and performance, a consideration of the manner in which these destructive emotions can produce the symptoms of physical disease real or simulated is essential. The frequency with which such extreme symptoms appear in the "fear of flying" syndrome, as in any combat or stress reaction, clearly illustrates the need for a close liaison between medical, psychiatric, and administrative authorities. It will also be seen that this combined approach facilitates detection and treatment of psychiatric and psychosomatic conditions which previously may have defied the efforts of any single agent—whether medical, psychiatric, or administrative. A review of the advantages and defects of past therapeutic and preventive techniques reveals many clues of future value in shaping and carrying out adequate and realistic measures of prevention.

PSYCHOSOMATIC MANIFESTATIONS OF "FEAR OF FLYING"

Meaning of "Somatic Compliance" Frequently during an early tour of combat flying, personnel come to the physician or flight surgeon because of various somatic disturbances or physical complaints which, although they may be supported by a certain amount of organic pathology, appear to produce a degree of incapacity far in excess of the physical findings. If during the incipient stage the physician or flight surgeon recognizes that this "somatic compliance" is the expression of anxiety related to underlying conflicts, frustrations, and ambivalent emotions which have been channeled into physical systems, he is best able to treat psychosomatic difficulties and to resolve emotional problems. The early discovery of the emotional meaning of such physical symptoms will prevent the loss of flying personnel through fixation on medical complaints and through the use of supposed physical incapacities to obtain secondary gain.

Somatic Manifestations of Emotional Conflicts When men with strong superegos are bombarded constantly by internal and

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external conflicts severe somatizations may occur. In the following case the conflict between the patient's desire to give up flying forever and his fear of being accused of failure, a dilemma which seemed insolvable caused a violent gastrointestinal reaction.

Case 13 Psychogenic gastrointestinal reaction. Because he had failed economically in civilian life a 31-year-old married navigator requested return to active flying status shortly after the outbreak of the Korean conflict although he had little true motivation for flying. He had not been trained for any civilian career in which he could expect advancement to high paying positions. The greater financial gain which he would accrue by returning to military duty as a captain on flying pay appealed to him very strongly. After a delay of several months he was recalled. During his retraining period as a navigator however he developed uneasiness and anxiety over his capabilities. Despite the criticisms he continued his duties because "I thought I would get over the upset feeling." Shortly after arriving overseas for combat duty he realized that his remaining inclination for flying had completely vanished. Despite this he flew 12 missions before he collapsed completely during an early morning briefing. On several occasions during the 12 missions he had developed severe nausea to the point of vomiting and had become so weakened that he could not perform his navigation duties adequately during flight. At these times he felt confused and actually disoriented. Because of his collapse he was sent to the hospital but all physical findings were essentially normal. Gradually in discussions it became evident that he had feared failure and loss of prestige in the eyes of his comrades so much that he could not properly quit flying so his only escape was to develop severe cardiovascular and gastrointestinal reactions. At first it was very difficult for him to comprehend that his somatic compliance was an expression of his need to fail and yet to save face. As the senior captain he had been expected to assume the duties of the lead navigator which would have meant assuming many responsibilities and the leadership of the younger navigators who should be able to regard him with great confidence and respect. This combined fear of responsibility and of failure in the eyes of others conflicting sharply with his deep dependent need to give up duties for which he no longer cared, caused a physical reaction so marked that it became necessary to ground him. It is evident that despite this man's conscientious attempt to force himself to accept flying again as a military career his whole organism revolted violently. The better solution was to ground him for a period and give him an opportunity to work through his underlying conflicts. Through psychiatric assistance he gradually became aware of the meaning of his emotional disturbances and willing to accept whatever action might be indicated. Because in reviewing his total situation it was believed that he would not make a suitable adjustment to military flying the recommendation was made to ground

him for a true neurotic reaction (psychogenic gastrointestinal reaction severe) thereafter he was either to be placed on ground duties or if administrative decision deemed it best to be separated from the service without dishonor In situations like this where the man sincerely tries to accept flying punitiveness might cause harmful sequelae This man's previous excellent World War II record should not be stained because of an emotional failure of this kind

Frequently it is possible to make use of a strong superego to motivate an otherwise unmotivated pilot to continue flying Such a man will continue to accept flying duties because his fear of the scorn of others and his own sense of personal integrity will not allow him to quit His need to develop a physical ailment which would excuse him from flying duty should not be considered a subterfuge or malingering, particularly if a strict superego is apparent³ In its presence, burdensome obligations or duties can be given up only through a physical or emotional breakdown This may be more clearly understood if the following case is considered

Case 14 Suspected hyperthyroidism masking "fear of flying syndrome" A 33 year old married first lieutenant had been recalled as a pilot from the National Guard He possessed an excellent World War II record as a pilot in multiengine planes Between World War II and the Korean conflict he had married and now had two children also he had completed his college training and was employed as a high school teacher in industrial arts In his National Guard status he had been teaching engineering at a nearby air base Upon his return to active duty he was assigned to continue these duties and was even promised that he would remain in this assignment for his entire tour of military duty Several months after his recall however he found that his name had been added in ink to an already published military order listing pilots selected for B 26 training and overseas duty He was deeply hurt by this transfer and resented the military for not keeping its promise Throughout his B 26 training which included night flying he constantly resisted his assignment to this type of flying and tried to influence his instructors with such statements as I can't fly B 26's at night I don't have enough instrument experience to be able to fly in severe weather Nevertheless because of his personal integrity and strong superego he continued to make sufficient progress so that he was graduated as fully capable of flying B 26's He made no further effort to get out of his flying duties at that time but shortly after arriving overseas before attempting even one mission he showed such physical anxiety and tremor that he was transferred to an Army hospital as a probable case of hyperthyroidism After 17 days of thorough evaluation, during which he was found to have no organic disease of any kind he was transferred to an Air Force facility for further review and disposition At this point he revealed his marked disinclination for flying especially for flying B 26's and ventilated his marked

resentment over the maltreatment he believed himself to have undergone at the hands of the military. Although at the time of his psychiatric review at an Air Force hospital no true anxiety was evident and his tremor had completely disappeared, he stated he would refuse to fly. After he had been given the opportunity to review his emotional problem completely in the light of his military situation and in accordance with the technique described above, he was returned to military duty, either to accept flying or to face administrative action for separation. It was interesting to note that when he returned to duty he resumed flying because he did not want his two daughters to think that he might be a failure if he were to face the punishment of administrative separation and the loss of his commission and pilot's wings. He then accomplished 30 missions without difficulty. During a leave of absence he presently indulged excessively in alcohol and underwent sexual experiences that were not in keeping with his moral and social pattern of behavior. Shortly thereafter he developed a brief post-alcoholic hallucinatory state in which he believed his comrades and other persons were making him the butt of pranks and of sexual advances. Upon psychiatric review it was evident that this hallucinatory state was a brief but dramatic demonstration of a severe superego reaction precipitated by his failure to live up to his strict moral standards. He reacted quickly, showing no other indication of personality disintegration or of mental derangement and, although he still had no great motivation for flying, he again returned to flying and completed his combat tour.

Comment. Certainly this type of person might better not have been recalled originally to flying duties, but once he had accepted such a status it was natural to expect that he should accomplish his duties effectively. That he did so despite temporary somatic and emotional disturbances indicates that his personal integrity demanded his compliance with authority. In this instance, following the resolution of somatic and emotional disturbances, the diagnosis would best be no psychiatric or physical disease present, qualified for full military duty including flying, so that if the man decided to give up flying, his disposition would be administrative. Despite failing motivation for flying, however, the man with a strong superego would more than likely accept flying duty quite readily if a small police action like Korea were to spread into a worldwide conflict. In such a situation the reality demands of the Air Force and the goals that it pursues would provide an adequate challenge. Because the mission of war would be a serious one imperiling our own nation, the attitude of the Air Force toward fear of flying would be more severe, and the man's own personal honor, integrity, and conscience would force him to live up to his obligations. Much as we might desire it, however, this would not relieve us of the problem of fear of flying, but it would stabilize the attitudes of

many men who might otherwise be influenced by other forces to react differently

A strict superego can also prevent a patient from facing his conflicts, and be instrumental in producing a psychiatric or psychosomatic disturbance which becomes woven so inextricably into the personality structure that even psychotherapy may fail. It also can relieve such a disturbance in order to make a patient effective again. Its dual role appears clearly in the following two cases. In the first, failure to recognize either the man's basic emotional conflicts surrounding flying or the strength of his superego which prevented him from taking definite action led to such a fixation of physical and mental attitudes that he was rendered ineffective, not only as a flying officer, but in any military capacity. In the second, psychiatric understanding of the underlying difficulties and recognition of a well structured superego resulted in aiding a well motivated man to continue his flying duties successfully.

Case 15 Fixation of psychogenic musculoskeletal reactions A strapping six foot 32 year-old regular Air Force pilot had suffered multiple contusions and subcutaneous hemorrhages in a B 26 crash in Korea. At the time of the accident he had remained conscious and was quite emotionally upset because he was unable to help a more seriously injured crew member. When hospitalized there was no evidence of any severe internal or external injury but he soon became black and blue all over. This he claimed produced a severe itching and aching of his entire body and rendered him extremely anxious, agitated, and difficult to handle. After transfer to a larger hospital despite various medical therapies he indicated he received relief from this itching and aching only by lying in a tub of warm water for long periods of time. After one month he appeared fully recovered from a medical viewpoint. Because of the severity of his total reaction he was transferred from Korea to Japan and given administrative duty requiring only the minimal amount of flying. At this point it should have been recognized that he was suffering from great emotional tension a reaction precipitated to a great degree by his aircraft accident. Over a period of months however he continued to be moderately ineffective complaining of the persistence of vague aches and pains feelings of lassitude and an inability to participate in any activity requiring even a minimal amount of physical exertion. At the same time he complained of difficulty in concentrating feelings of confusion and a marked inertia which frequently made him procrastinate and delay in performing certain inspection duties that infrequently required his flying as a passenger to various parts of Japan and Korea. Because of his persistent complaints he was examined repeatedly yet no one could find any pathological condition which would explain the marked degree of his complaints. While it was agreed that in his accident he probably

had sustained multiple minor hemorrhages not only subcutaneous but also into muscle tendons and internal structures. It was believed that almost a year later the residue would be minimal. Finally, about one year after his original injury because of the evident discrepancy between the physical findings and his many complaints, he was examined psychiatrically and it became evident that he had developed a marked fixation to the point of a severe psychogenic musculoskeletal reaction. In discussions it became evident that his feelings toward his military career and flying status had always been markedly indecisive and ambivalent. While he had a good record in World War II and was regular Air Force officer, his promotions had come very slowly, whereas many of his contemporaries were of higher rank; he was still a captain. There were indications that notwithstanding his administrative abilities and leadership qualities had never been highly regarded. Although he appeared to be big and powerful (his background revealed that he had been football player in college and he described himself as one who could never accept defeat), in reality he was mild-mannered and non-aggressive. While he could be aggressive on the football field, he was really shy and sensitive in his interpersonal relationships. It also became evident that he actually had decided to give up flying, but his strict superiors would not permit him to do so. Consequently, he remained in a state of ambivalence and anxiety and eagerly grasped his original musculoskeletal injuries as a focal point in which he could blame his difficulties in making an adjustment. This ambivalent and undecided state is clearly illustrated by his statement: "I require 16 hours of sleep. I feel tired all the time. I want to quit, yet I don't want to quit. I make myself do it. I won't admit defeat, but I even start hurting before I wake up. While unconsciously he did not feel adequate to take responsibility for most pressing conflict as a result of many officers in the Air Force evolved around what would happen to his future Air Force career if he were to give up flying completely. This in his mind meant survival to other flying officers' loss of prestige and less opportunity for advancement to command positions. While he was really not able to succeed to him required being one.

In this case it is firmly believed that if this man had been approached from a total viewpoint shortly after his recovery from his severe accident, multiple psychotherapeutic measures might have helped him understand his emotional conflicts and perhaps have prevented him from becoming as incapacitated as he felt. Again, psychotherapy might have helped him recognize how many of his unconscious feelings concerning responsibility and group status were now manifesting themselves in the physical symptoms that prevented him from functioning successfully as a flying officer. His severe super ego would allow him to accept no defeat other than a physical illness through which the medical service could blame him from any blame for his failure. At the least, the use of his psychiatric review would become any attempt to help him resolve his conflicts or to dissociate them from his physical

being was met with great emotional resistance it became necessary to ground him medically because of his persistent psychogenic musculo skeletal reaction and he continued in his administrative duties. His superego would not let him recognize the true cause of his present inertia or the meaning of his physical impairment.

In many instances, especially in relation to the "fear of flying" syndrome, some medical officers fail to recognize the real meaning of various complaints, and "sing in harmony" with the patient through repeated valiant attempts to find an organic reason for the disturbance. At times many men have been grounded for excessively long periods because of repeated examinations, unnecessary tests, and frequent transfers to different hospitals. This delays necessary final decisions in many simple cases where often no true underlying organic pathology can be found to explain the symptomatology. It is also a disservice to the fliers who instead of being helped to face their conflicts, are encouraged under the guise of a diagnosis of physical illness, to persist in their behavior. This is well illustrated by the case of a pilot, grounded for over two months, in whom no real incapacitating organic pathology was ever uncovered.⁵

Case 16 Vague physical complaints cause unnecessarily prolonged grounding Following the completion of only two missions in T 6 aircraft a 32 year old married recalled pilot reported to the flight surgeon complaining of blurred vision difficulty in reading the instrument panel and difficulty in depth perception which gave him trouble on making landings. He also complained of lassitude and loss of appetite and difficulty in sleeping. Because his duties called for low altitude observation of enemy positions and personnel on the front lines it was necessary for him to maneuver his plane constantly in order to avoid damage or injury from enemy gunfire. Upon examination the flight surgeon could find nothing wrong with this pilot's eyes or depth perception and attempted to reassure him; however the pilot was sure that some physical disorder was present. Several days later while still temporarily grounded he complained of severe headaches and pain in his nose and sinus. These complaints caused him to be grounded repeatedly for tests and retests; he was even flown to one major hospital for a complete eye examination and to another for a complete ear nose and throat evaluation. Diagnoses and opinions concerning his complaints were vague and conflicting. In reviewing all the physical findings described in his abundant medical records no truly incapacitating pathology was ever found. In one instance even though the report of the physical examination did not reveal evidence of nasal congestion, inflammation or excessive discharge the diagnosis of allergic rhinitis was made. Although brief mention was made in several instances of the possibility that his difficulties might be emotional he was not sent for complete final psychiatric and physical evaluation until his case was brought to the attention of higher medical

authorities. In the face of conflicting medical reports his undecided status left his immediate superiors uncertain as to how to use him in any suitable job. Though masked by somatic complaints the role played by emotional conflict in this man's fear of flying was finally established. As soon as he understood that his physical complaints were not supported by physical evidence and that perhaps other conflicts were affecting him, he demonstrated great resistance toward further understanding of his symptomatology. Psychotherapeutic discussions over a period of 10 days and a tactful presentation of his situation resulted in complete understanding of his behavior and he finally expressed his willingness to return to Korea either to accept flying or to face administrative action. Prior to this, when he thought he might be forced to return to flying, he had stated: "If I have to fly T-6s it will be at my disadvantage because of my eyes and headaches. I don't think it will work." He originally had asked to fly C-47s because in this duty he would have a copilot who could check him in case he developed trouble with his vision. Investigation revealed that this officer claimed he had only been trained to be a C-47 pilot so when he was chosen to fly T-6s he could not understand the rationale of this assignment. In addition, he was concerned to find that his duty as a T-6 pilot included periods of ground duty as an air ground liaison observer for his unit at the front lines with artillery units. He had been recalled to active duty involuntarily and resented leaving his family and a lucrative civilian position. Much more important was his reaction to the fact that by the time he received his overseas orders he had only about seven months of his tour of duty to complete and by the time he arrived overseas he actually had less than six months to complete before discharge. At that time anyone who had six months or less remaining ordinarily would not have been given overseas orders. His immediate assignment to the front lines meant facing combat and possible death for the remaining few months of his military tour. He resented deeply the fact that other pilots with many more months of service to render remained in the states and believed that he had been sent over to do their job. When telling of three C-47 pilots who had been transferred to single engine aircraft against their personal wishes and killed during training, he revealed that his confidence in himself and in single engine aircraft was shattered. These conflicts in relation to authoritative control forced him to seek illness so that he could fail in flying without losing prestige within his group. His need to be ill as an excuse from flying is clearly a necessary defense against being considered a coward. The indecisive results of his many examinations properly determined by his influence over the physicians only served to fix in his mind the idea that some physical disease must be present. It was evident that to avoid working out his real type conflicts this pilot had to find something wrong with himself. Upon conclusion of his treatment, however, though still voicing resentment over his lot and some envy toward men in comfortable positions in the United States, he demonstrated a better

attitude toward his flying duties. He was further advised that when he returned to Korea he should discuss his total situation frankly with his flight surgeon and the commanding officer of his squadron. He was then returned to his combat base with the final diagnosis "No disease found fully qualified for military duty including flying." Later reports indicated that after a serious conference with his commanding officer and flight surgeon he returned to his flying duties and had no further difficulty.

Comment In this case it is evident that repeated delays and procrastinations in obtaining final medical and psychiatric decisions had served to keep this pilot needlessly grounded for so long a period that he might never have returned to flying. In evaluating the total situation the medical, psychiatric and administrative aspects stand out clearly. Although medical opinions were vacillating, firm and decisive psychiatric attitudes helped the pilot to face his administrative problem and return to effective duty.

The combined medical, psychiatric, and administrative approach, as demonstrated above, can always help officers in command decide how far punitive or disciplinary measures should go. The attitude of the Air Force toward the total problem should be a flexible one depending not only on a man's visible behavior but also on the reality factors revealed: the conflicts found, his personal integrity, the underlying motivation and, last but not least, the actual mission of the Air Force at the time the problem appears.

Somatic Manifestations of Defective Personality Structure
When it is seen that a man's lack of motivation for flying stems from a defective personality structure, demonstrated either through basic inadequacies or by lack of loyalty toward the group or himself, the medical officer and administrative authority should work closely together to arrive at a sound decision regarding his disposition. Such men also develop the "fear of flying" syndrome and must be handled appropriately. A consideration of the following case reveals clearly the action to be taken, it also demonstrates how the presenting symptomatology may change its form as rapidly as did the old man of the sea.³

Case 17 Variation in symptomatology in basically inadequate pilot
Two months after his marriage a 24-year old second lieutenant pilot arrived in Korea for combat duties but immediately complained of severe headaches which made it impossible for him even to start his B 26 fighter bomber combat training. He presented his symptoms with such apparent sincerity that he aroused medical concern when he revealed that about 14 months earlier he had struck his head and had been unconscious for a few moments in an aircraft training accident. Despite the fact that he had not suffered any subsequent difficulty in performing his

performing duties in the United States his complaints were so convincing that they resulted in his undergoing a complete medical and neurologic review in an Army hospital lasting several weeks. All findings including skull roentgenograms, laboratory studies, and electroencephalograms were considered normal. He was therefore sent to the Air Force processing center for return to his combat unit in Korea. Here he immediately presented such bizarre behavior and confused thinking that he was admitted to an Air Force hospital because of a suspected psychosis. In this hospital it quickly became evident that his behavior was largely assumed and considerably motivated by his desire to avoid returning to Korea and combat flying. There was no evidence of any real anxiety. He would repeatedly approach the physicians with mildly eccentric behavior and in his discussions he would talk of worries over masturbation and fears of homosexuality. He would assume infantile positions in bed and act disinterested and withdrawn but was easily aroused from these states. There was no evidence of any true psychotic disturbance or emotional conflict beyond that of accepting his military obligations. Review of his civil life revealed that although he was intelligent and had been capable of becoming a pilot he had never really made a good adaptation to anything in the past. His only motivation for learning to fly was the desire to avoid serving in the infantry. During psychiatric treatment he maintained a negativistic approach to the solution of his problems but when he realized that his behavior and his underlying inadequacies failed to obtain his release from his obligations he gradually gave up his pseudopsychotic behavior. He was returned to Korea with the diagnosis. No physical or psychiatric disease found fully qualified for military duty including flying. Together with a full report of his background and behavior. One month later because on his return to Korea he had again refused to fly and was now facing administrative action and separation he was referred for a final psychiatric evaluation. During this examination he was found to be cheerful and superficially cooperative and showed no evidence of any disturbed behavior. He stated frankly that he was through with flying and his problems were solved. He showed no evidence of remorse over failing to live up to his military obligations and demonstrated that he was a person who sought only to satisfy his personal selfish end. He felt no concern toward the needs or feelings of others and no real loyalty to the group.

Comment. The evolution of this case should constantly be kept in mind by medical officers because it reveals how vague symptomatology can lead to long investigations and how rapidly symptoms may change as one by one they are taken away from the patient. It is possible however that had the meaning of this man's original complaint of headache been recognized and had he been evaluated both medically and psychiatrically while at his own duty station or within its immediate vicinity he might have been led into accepting his combat flying duties despite his underlying inadequacies, poor motivation, and well demonstrated

been told it was epilepsy and he had taken medication for about one year. Because every military pilot should have been questioned adequately concerning the history of recent seizures such seizures being definite disqualifications for military flying this request seemed absurd. Upon further questioning however he indicated that he had been treated three years previously and had then discontinued treatment because the seizures had disappeared. About a year prior to the present examination he had had the opportunity to join a National Guard unit which allowed him to return to flying status flying T-6's. At the time of that examination he had said nothing about his previous spells because he had not had any for over a year and he was not asked if he had anything like seizures or epilepsy. It was established however that if this man had properly filled out his required medical history this history of seizures would have been uncovered and if true would subsequently have disqualified him for flying. Nonetheless he came on active duty as a pilot chiefly in motor pool administrative work. He usually flew only as a second or third co-pilot in C-47's to get his flying time. He rarely took any real responsibility for the manipulation of the plane. Except for his stated history complete physical review failed to disclose any evidence of seizures. On one occasion he was rushed to the dispensary because he had passed out but upon examination and from reports from observers there was no evidence to corroborate the findings of a true seizure of any kind nevertheless he was held grounded during investigation. Psychiatric review indicated that he had been a commissioned pilot in World War II but had actually been flying in single engine propeller driven aircraft for only one month when he was hospitalized because of vaginal and urethral symptoms. After discharge from the hospital which occurred at the close of World War II he did not return to flying status and was discharged from the service shortly thereafter. During this interim period he claimed he had developed some seizures. His adjustment in civilian life had been barely adequate. Despite the fact that he had actually flown only a very limited number of hours during World War II he had been able to manipulate his return to military flying through personal contacts. Correspondence was initiated in an attempt to obtain the reports of his original physical examination upon recall but these were not forthcoming. A review of his military efficiency prior to coming overseas and while he was on duty at his present air base indicated that he was really an inferior officer whose attitude and intelligence were below average. Because he demonstrated no drive to improve himself and his actual ability in any capacity was questionable he was not considered to be a suitable officer for prolonged military service. Though the history of a barely adequate adjustment in civilian life made it advisable to allow him to request separation from the service on the basis of his military category status. Because by both psychiatric and administrative criteria it was believed that he was actually a debit to the service the pursuit of more drastic disciplinary measures in an attempt to promote malingering or simulation

of "seizures" was considered to be a waste of time. The ease with which he revealed the history of his "spells" thus ensuring his being grounded whenever a transfer to fighter or combat flying appeared imminent demonstrated that his motivation for flying was minimal. This man's basic inadequacies and lack of true loyalty to himself or others indicated that the best solution was to separate him from the service and terminate his commissioned status.

Comment It must be admitted that, from either a psychiatric or an administrative viewpoint, it is far more profitable to assist well motivated flying personnel in resolving their emotional disturbances than it is to prove or disprove a history such as the one given above. A combined medical, psychiatric, and administrative investigation of all factors will keep well motivated men from being lost to military flying, and will also remove inadequate, disloyal persons from important positions.

Such somatically disguised problems presented by the fear of flying syndrome are not new to the Korean conflict during World War II; they were found both overseas and in the United States. At that time many men evacuated to general hospitals in the United States with emotional or physical disturbances identical with those described above clung so tenaciously to their psychosomatic or psychiatric difficulties that medically they were considered to be incapacitated. Many, even years after release from active duty, repeatedly met retiring boards or sought veterans' compensation for these bizarre complaints. That this occurred on such a scale was due to the then widespread error of tagging these men with psychosomatic or psychoneurotic labels, when their real problems revolved around basic emotional conflicts which could have been better handled in the manner described in this article. Early psychiatric treatment can now uncover the basic problems so that the patient can be treated and motivated to accept his duties and obligations.

TREATMENT TECHNIQUES

The Principle of Deterrence In dealing with the fear of flying* problem, the Air Force, from time to time in the past, has set up definite policies varying from harsh punitive measures to simple separation. Such marked variations in policy have been due to the interaction of conflicting interpretations of the problem with the very real necessity for maintaining the fighting strength of the Air Force. Due to the authoritarian nature of military life and discipline, it has always been true that some superiors have expected all subordinates to conform and to live up to their obligations regardless of fundamental problems and anxieties. Such a superior, already resistant to fulfilling many of his men's basic needs for dependency and security, may believe that a man can control himself through will power or can be

been told it was epilepsy and he had taken medication for about one year. Because every military pilot should have been questioned adequately concerning the history of recent seizures such seizures being definite disqualifications for military flying, this request seemed absurd. Upon further questioning, however, he indicated that he had been treated three years previously and had then discontinued treatment because the seizures had disappeared. About a year prior to the present examination he had had the opportunity to join a National Guard unit which allowed him to return to flying status flying T-6's. At the time of that examination he had said nothing about his previous spells because he had not had any for over a year and he was not asked if he had anything like seizures or epilepsy. It was established, however, that if this man had properly filled out his required medical history this history of seizures would have been uncovered and if true would subsequently have disqualified him for flying. Nonetheless he came on active duty as a pilot, chiefly in motor pool administrative work. He usually flew only as a second or third co-pilot in C-47's to get his flying time. He rarely took any real responsibility for the manipulation of the plane. Except for his stated history, complete physical review failed to disclose any evidence of seizures. On one occasion he was rushed to the dispensary because he had passed out, but upon examination and from reports from observers there was no evidence to corroborate the finding of a true seizure of any kind. Nevertheless, he was held grounded during investigation. Psychiatric review noted that he had been a commissioned pilot in World War II but actually been flying in single engine propeller driven aircraft only a month when he was hospitalized because of vague cerebral symptoms. After discharge from the hospital, at the close of World War II, he did not return to flying. He was discharged from the service shortly thereafter. During this time period he claimed he had developed some seizures. His adjustment in civilian life had been barely adequate. Despite the fact that he had actually flown only a very limited number of hours during World War II, he had been able to manipulate his return to military flying through personal contacts. Correspondence was initiated in an attempt to obtain the reports of his original physical examination upon recall but they were not forthcoming. A review of his military efficiency prior to coming overseas and while he was on duty at his present assignment indicated that he was really an inferior officer whose attitude and initiative were below average. Because he demonstrated no drive to improve himself and his actual ability in any capacity was questionable, he was not considered to be a suitable officer for prolonged military service. This and the history of a barely adequate adjustment in civilian life made it advisable to allow him to request separation from the service on the basis of his military category status. Because by both psychiatric and administrative criteria it was believed that he was actually a debit to the service, the pursuit of more drastic disciplinary measures in an attempt to prove lingering or simulation

Recommended Therapeutic Approaches Treatment of each case must be individualized, taking into consideration the various medical, psychiatric, and administrative aspects, but focusing chiefly, according to the decision reached, on returning men to effective flying status or on removing those found to be unacceptable or inadequate.⁷ Because the aim of this article has been to demonstrate the "fear of flying" syndrome and its symptoms, and to provide a practical approach to the problem, no attempt has been made to discuss at length such dynamic concepts as sexual symbolism in flying oedipal relationships, or problems of ego development. It is believed that the suggestions below, if properly followed, will be of great value in maintaining flying effectiveness.

1. When a problem is clearly recognized as a "fear of flying" syndrome, it should be investigated, evaluated, and treated as near to the duty assignment as is logistically and medically possible. This approach approximates the same technic that the Army uses in handling its front-line combat psychiatric problems. For the farther back in medical or administrative echelons that these men are allowed to proceed the more difficult it becomes for them to give up their deeply rooted syndromes. Difficult cases of course, requiring specialized treatment, must be transferred sufficiently early for therapy to be successful.

2. To avoid the extremes of an overly sympathetic identification with the patient or a rigidly punitive attitude toward him the medical officer should maintain an open minded but critical position. If as a physician he approaches each man's difficulty with an honest and serious interest, his patients will understand that he is doing his best to help them resolve their problems.

3. During therapy the medical officer constantly offers his personal support and strength to help the flier work out his problems in reality because strong ego support may help him shift displaced anxiety from the "fear of flying" back to its original source.

4. Because he may possess conscious or unconscious conflicts similar to his patient's, the medical officer avoids an over identification to forestall the development of an excessive dependency through which the patient may attempt to control him. Often when a physician attempts to sever the bonds of such a relationship he finds that they are far stronger than he at first suspected. This consequence of over identification was well illustrated in case 16. The physician's attitude therefore though it may be warm and friendly must also be firmly objective, leaving the patient free to make his own decisions regarding his future course of action.

5 When a patient speaks openly of an uncontrollable "fear of flying" the medical officer must curb his annoyance at such prefatory remarks as "I have made up my mind nothing can change it. I have this fear and I can't see where you can help me." Frequently the man has been instructed by command order or medical authorities to come for further evaluation, a procedure which he may believe is unnecessary. Regardless of the resistance which he may encounter, the medical officer encourages the patient to discuss his problems. If the patient displays open suspicion and resentment because of the belief that he has come to be forcibly returned to flying duty, the medical officer may say, "I am not necessarily trying to make you change your mind concerning flying. I am really trying to understand more clearly what may have affected you so strongly. Perhaps if we learn a little more about the total situation we can both understand it better." On the other hand, if the patient is asked directly, "What emotional problems have you?" more often than not such a question will meet with marked resistance because it implies that the patient may be mentally deranged or weak and incapable of handling his own affairs. Frequently he may not know the real nature of his problem. But if the patient is encouraged to talk about himself, his flying, his daily activities, his family, and his general background and interests, the discussion will usually provide the physician with clues to the nature of the patient's conflicts and frustrations, and also help the patient gain insight into his own attitudes toward others and toward his reality situation. Although this emotional uncovering may take several sessions to complete, it should reveal enough about the patient and his problems to enable the physician to arrange significant factors in a meaningful relationship, thus making a satisfactory resolution of the patient's conflicts possible.

6 If physical complaints or disturbances are present, as has been evident in the cases described above, a complete medical investigation should be carried out at once and its findings should be considered final. Repeated half-hearted histories and inconclusive physical examinations not only confuse the physician but make the patient feel that the physician himself is incapable of handling the problem, and that some serious physical disturbance which the physician cannot recognize is present. If any medical or psychiatric question remains unanswered, immediate consultation asking for specific information and medical opinions should be obtained to prevent the long delays and needless grounding which give the patient time to brood over his condition.

7 When the patient's physical complaints are not supported by physical findings or are far in excess of minimal physical findings, the medical officer should not jump to the conclusion that the man is malingering; neither should he accuse the patient

directly and brashly of having a "fear of flying." The physician should approach the problem from a total viewpoint and indicate tactfully that, because the patient does not present any physical disturbances which can warrant medical grounding, the possibility that basic conflicts may be responsible for his aberrations should be investigated. At this point the patient may react in a hostile manner or even undergo an intensification of physical symptomatology, as though to prove that he is really ill. The physician must not be alarmed by this, but must help the patient to work through his conflicts, thereby obviating the need for the somatic fixation. As physician and patient begin to understand the meaning of the basic problem, both will better learn how to arrive at a solution.

8 If, as in cases of an acute reaction in early combat, the patient is openly agitated and confused to the point where he loses control completely, strong reassurance, adequate sedation and a brief period of complete rest may be important to a quick recovery of earlier acceptable defenses. In many instances the flight surgeon regularly helps many such patients. The simple technic of allowing the patient to ventilate his conflicts, associated with supportive reassurance is markedly effective in suppressing or repressing unwholesome reactions.

9 When the effect of severe emotional distress is perceived either in an openly expressed "fear of flying" or by psychosomatic symptoms, or when the patient appears to be emotionally resistant to overt aid, more expert psychiatric assistance should be requested and employed.

10 Depending upon the severity of the case psychotherapy can then be carried out on an outpatient or inpatient basis. At the beginning of treatment the average patient may be kept grounded medically. If he responds suitably he can be returned to flying, even though psychiatric treatment is continued. Even though mild anxiety or some psychosomatic complaints may persist, the patient can return to his reality obligations because he has attained an understanding of his fundamental difficulties through "corrective emotional experiences." This activity can be of tremendous help to him in resolving many of the conscious or unconscious tensions related to his earlier problems. That this can be done has been demonstrated in foregoing cases.

11. In every case the role of the superego or conscience should be closely studied by the physician and should weigh heavily in determining the extent of administrative action. An understanding of the role of the superego also gives the medical officer a prognostic measure of how well the patient will accept further flying duties. The more active the superego in precipitating psychiatric or medical incapacities, the more the physician should

strive to help the patient resolve his problems. A well structured superego can be used to motivate the patient to accept his military and flying obligations.

10 The medical officer should not fear that his responsibilities for treating the patient medically and for contributing to administrative decisions when indicated are contradictory. If this dual role implies to the patient that the medical officer is guided only by administrative direction and authoritative attitudes, the medical officer must make it apparent that *he is really interested in helping the patient arrive at the best solution for whatever problem he may have*.

Recommended Diagnoses and Disposition of Cases Finally when the medical officer has a clear understanding of the total problem based upon all of the factors involved he should make his own decision as to what action he will take. He must not shirk his responsibilities or fear the consequences of his action. While he should not consider himself as infallible his decisions if sincere and honest will regularly be well advised. These decisions will include:

1 When examination reveals no psychiatric or physical disease and no evidence of marked underlying conflicts the patient is returned to full duty with the expectation that he will resume these duties and do well (cases 2 3 6)

2 When examination reveals no psychiatric or physical disease but personal integrity, loyalty and proper motivation for flying are absent the patient is returned to duty to accept his flying obligations or to face administrative action (cases 9 17 16)

3 When examination reveals definite emotional distress the patient is given the benefit of psychotherapy either superficially by the medical officer or flight surgeon himself or if the emotional distress is too complex by trained psychiatrists oriented toward Air Force problems. Following treatment most of these men can be expected to return to flying duties despite a residue of mild anxiety or mild psychosomatic disturbances which they can handle adequately. At this time the diagnosis will generally indicate that the somatization or psychiatric reaction is cured or improved and the patient is fit for flying duty or it will be "No psychiatric or physical disease found fit for full military duty including flying" (cases 1 4 5 7 8 11 12 14 16)

4 When examination reveals that the psychiatric difficulties or psychosomatic symptoms are so deeply ingrained that treatment would require a long period of intensive psychotherapy the medical officer should have no fear of medically grounding the patient in an attempt to help him make a better adjustment for his

future life. If he succeeds in resolving his anxieties, he may later be considered for flying duties, if he does not, he should be kept grounded (cases 10, 13, 15).

INCIDENCE IN FAR EAST

An analysis of the cases found among flying personnel of the Far East Air Forces reveals that in relation to the total number of flying personnel the incidence of men involved in such difficulties has actually been very low. Examples have occasionally been found among noncombat personnel but more frequently among men in combat areas. Almost all have been reserve or National Guard recallees; however, a small group of recently commissioned flying officers were in the group. No regular Air Force flying officers reached administrative disposition because of "fear of flying" itself, but some regulars did show psychosomatic disturbances characteristic of this syndrome. One (case 15) had to be evacuated medically.

About half had World War II experience. Of this World War II group, slightly more than 50 percent had undergone combat flying experiences, but the cessation of Korean hostilities did not eliminate "fear of flying" problems. Within the first six weeks following the "cease fire" armistice, four flying personnel were referred for psychiatric review because of "fear of flying."

As far as rank was concerned, most cases were equally distributed between first lieutenants and captains, with a small number of second lieutenants and two majors. Most therefore had had excellent previous flying training and had shown their ability to carry on their assigned duties efficiently enough to receive promotions. The majority were in the Far East theater for two to three months before they were referred for complete psychiatric evaluation. Those few cases which developed immediately upon arrival in the Far East occurred in men possessing basic personality defects and inadequacies. Pilots outnumbered navigators, but navigators or radar observers represented a higher number in relation to the total number of flying personnel in their specific categories.

More cases occurred in men flying fighter bombers or fighter interceptor type aircraft. Other cases were equally distributed among those in administrative transport, tactical reconnaissance, and strategic air defense flying. Only rarely was a fighter pilot involved, and then only for psychosomatic disturbances early in combat which shortly thereafter subsided. In very few instances was a previous aircraft accident or other harrowing experience found to be important in precipitating a "fear of flying" reaction.

All the men involved were between the ages of 22 and 36 years. In a small group, assignment to flying unfamiliar planes was a

strive to help the patient resolve his problems. A well structured superego can be used to motivate the patient to accept his military and flying obligations.

1^o The medical officer should not fear that his responsibilities for treating the patient medically and for contributing to administrative decisions when indicated are contradictory. If this dual role implies to the patient that the medical officer is guided only by administrative direction and authoritative attitudes, the medical officer must make it apparent that *he is really interested in helping the patient arrive at the best solution for whatever problem he may have*.

Recommended Diagnoses and Disposition of Cases Finally when the medical officer has a clear understanding of the total problem based upon all of the factors involved, he should make his own decision as to what action he will take. He must not shirk his responsibilities or fear the consequences of his action. While he should not consider himself as infallible, his decisions if sincere and honest will regularly be well advised. These decisions will include:

1. When examination reveals no psychiatric or physical disease and no evidence of marked underlying conflicts, the patient is returned to full duty with the expectation that he will resume these duties and do well (cases 2, 3, 6).

2. When examination reveals no psychiatric or physical disease but personal integrity, loyalty, and proper motivation for flying are absent, the patient is returned to duty to accept his flying obligations or to face administrative action (cases 9, 17, 18).

3. When examination reveals definite emotional distress, the patient is given the benefit of psychotherapy, either superficially by the medical officer or flight surgeon himself or if the emotional distress is too complex by trained psychiatrists oriented toward Air Force problems. Following treatment, most of these men can be expected to return to flying duties despite a residue of mild anxiety or mild psychosomatic disturbances which they can handle adequately. At this time the diagnosis will generally indicate that the somatization or psychiatric reaction is cured or improved and the patient is fit for flying duty or it will be: No psychiatric or physical disease found, fit for full military duty including flying (cases 1, 4, 5, 7, 8, 11, 12, 14, 16).

4. When examination reveals that the psychiatric difficulties or psychosomatic symptoms are so deeply ingrained that treatment would require a long period of intensive psychotherapy, the medical officer should have no fear of medically grounding the patient in an attempt to help him make a better adjustment for his

It must also train its flying personnel to face conflicts, frustrations, and separations from families and civilian careers frankly and with equanimity

The Air Force must help its flying personnel develop greater confidence in themselves, their superiors, and their airplanes. If the Air Force would recognize that frustrations, resentments and various other problems will arise despite all efforts to avoid them, it can help each man so affected to deal with his difficulties with more understanding, thus giving him a greater chance of overcoming them and of making a better adjustment to reality. Also, the knowledge that his human needs are being considered with sympathy and understanding even though they may not be gratified will give him a sense of belonging. All this creates a high motivation and an "esprit de corps" vital to the successful functioning of the group.

In his therapeutic position as a physician and advisor, the medical officer, flight surgeon, or psychiatrist must understand that his role in combating the "fear of flying" consists of helping these men to adapt to their total life situation and to prevent their succumbing to unwarranted failures. If he condones or accepts somatic subterfuge whether conscious or unconscious, and allows it to become fixed, it may incapacitate a normal man and prevent his adaptation in later life, developments which, as we regretfully know from our experiences in World War II, might be avoided.

In this connection it is well to remember the point made by Petersen and Chambers,⁸ who, in discussing the perpetuation of war neuroses in Army personnel, stated that "Two things are of extreme importance—gain and guilt. The primary gain of removal from danger may be later complicated by financial gain in the way of pecuniary compensation. Such gains may be resolved. However, the burden of guilt that a soldier assumes once evacuated from combat for less than the very best of reasons is an intolerable thing, which the patient may well carry with him the rest of his life to his considerable detriment. We have all had plenty of sad and disheartening experiences in the treatment of NP casualties of the last two wars who were the victims of ill advised evacuation. It may seem unkind to require further duty of a person who appears anxious and uncomfortable, but the greatest psychiatric mishandling and the greatest possible unkindness, is the medical evacuation of a patient who has not yet performed with the degree of honor required of him by both his superego and the community as he sees it, aiding him to burn his bridges behind him and making his guilt irrevocable."

I believe that the same is true of those Air Force men whose real difficulties are masked behind the "fear of flying" syndrome.

If we sing in harmony with the patient fix his secondary gain, and perpetuate his conscious or unconscious feelings of guilt over his failure to continue flying we can be sure that we are not helping him toward a better adjustment to reality. A sincere effort on the part of all Air Force officers to better understand what the "fear of flying" syndrome means in each patient will undoubtedly keep most flying personnel from succumbing to those emotional conflicts that can otherwise be successfully resolved.

SUMMARY

Based upon clinical experiences with "fear of flying" problems arising among flying personnel of the Far East Air Forces an attempt has been made to clarify the nature of the "fear of flying" syndrome and to provide an understandable and workable solution for this problem by means of a combined medical psychiatric and administrative approach. The "fear of flying" syndrome has been defined as a complex reaction manifested by various behavior disturbances or psychosomatic reactions and occurring among flying personnel as a result of anxiety generated from multiple external and internal conflicts, frustrations and dangers. As such it differs from the expression of the basic possibly universal fear of being maimed, mutilated or killed by falling through space and hitting the ground with great force. This basic fear of injury or death inherent in flying serves only as the focal point for the accumulation of anxiety which has been generated by comparatively unrelated emotional conflicts, thus producing a "fear of flying" syndrome. The manner in which this syndrome develops in relation to the most significant conflicts capable of producing it has been traced and specific case histories have been cited to illustrate the various components of the problem. Principles of treatment have been outlined and their use demonstrated in actual cases to indicate what techniques will provide the best solution in each instance. The role of the super ego as a prognostic and therapeutic agent has been emphasized with special reference to cases showing psychosomatic expressions of this syndrome.

The thesis has been advanced that if the Air Force is to prevent such emotional reactions as the "fear of flying" syndrome from impairing the efficiency of its flying personnel it must go beyond the mere provision of a physical armor which in spite of all the advances of aeronautical and aviation research which it represents cannot provide the ideal conditions for full faculty performance in the absence of a stable psychic armor. The Air Force must realize that pilots are human beings and do some thing constructive about their human needs. Through tolerance and understanding the Air Force can assist these men to face their conflicts and frustrations by instilling in them a feeling of belonging and a sense of the importance of their roles however

great or small, in the successful accomplishment of the Air Force mission. This can be done only if the Air Force will take definite steps to increase the satisfactions that can be derived from membership in an outstanding Air Force. Because the airplane is merely an extension of man's hands, feet, body, and senses, its value as a military tool depends upon the skills of the men operating it.

Finally, it has been demonstrated that, through early understanding and proper treatment of emotional conflicts, preventive aviation psychiatry can play an important role in maintaining flying personnel at a high level of effectiveness, or in restoring impaired persons to their previous effectiveness. This article has definitely indicated that further intensive study of important basic emotional factors is of the highest importance if the nation's need for a powerful and competent Air Force is to be served.

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THE HUMAN FACTOR IN AIR COMBAT

For the Air Force pilot, air-to-air combat in the jet age is still a personal dogfight. Once the convulsive air battle has been joined, no electronic guiding device yet developed can substitute for a pair of sharp eyes, skilled senses, and an alert human mind capable of translating into stick and rudder action the decisions that produce a kill. Sober analysis of air warfare and homage to technological progress sometimes lose sight of this man. He is yet the physical, mental, and emotional mechanism that can transcend the inescapable limitations of highly developed technology to permit selective reaction, subtle interpretation, and command decision. The greatest technical accomplishments have merely supplemented his skill, ingenuity, and adaptability. Without him they are as meaningless as any other tools without a craftsman.

INFECTIOUS MONONUCLEOSIS

A Review of the Literature

STEPHEN J BERTT M J MC USA

INFECTIOUS mononucleosis is characteristically described as a benign disease of unknown etiology possibly caused by a virus and beginning with chills fever sore throat generalized myalgia and malaise. The most significant physical findings usually are lymphadenopathy and a palpable spleen. With these signs and symptoms the diagnosis can be confirmed by obtaining a blood smear showing a relative lymphocytosis with many atypical forms and blood serum with a significantly positive heterophil antibody reaction. The disease is commonly self limiting and terminates in complete recovery except in a small percentage of patients in whom fatigue and an abnormal blood smear may persist for weeks or months.

Within the past decade an increasing number of patients with infectious mononucleosis with a variety of unusual manifestations has been reported so that it appears now to be a disease of protean manifestations second to none. Jaundice has been reported often enough in infectious mononucleosis to warrant serum determinations for the heterophil antibody in almost every case of infectious hepatitis. Contratto and Read and Helwig² reported jaundice in 5.1 and 3.7 percent respectively in their series of cases. Originally jaundice was ascribed to enlargement of lymph glands in close proximity to the bile ducts but more recently it has been demonstrated that hepatic impairment occurs in infectious mononucleosis which in rare cases may even lead to cirrhosis of the liver. To illustrate the bizarre way in which this disease may appear Read and Helwig divided the signs and symptoms in four main groups: (1) respiratory with nasopharyngitis cough epistaxis and tonsillitis; (2) gastrointestinal with nausea vomiting and abdominal signs; (3) anemias including hypoplastic and hemolytic anemias and thrombocytopoenia; and (4) dermatological with rashes pruritus and jaundice. It is apparent then that infectious mononucleosis may simulate an acute surgical condition in the abdomen or a variety of skin rashes and be confused with typhus fever measles scarlet fever typhoid fever or secondary syphilis. Confusion with syphilis may be a particular problem if a false positive serologic reaction for this disease is present.

MULTIPLE SYSTEM INVOLVEMENT

Encephalitis with dysphasia and mental confusion, or meningitis with a lymphocytic response in the spinal fluid may be encountered in infectious mononucleosis as well as other unusual central nervous system manifestations including cranial nerve palsies.⁷⁻⁹ Bernstein and Wolff¹⁰ in reviewing a large series of cases tabulated the following neurologic abnormalities associated with infectious mononucleosis: serous meningitis (spinal fluid normal with physical signs of meningeal irritation), four cases, meningitis (pleocytosis with increased protein and pressure in the spinal fluid), 13 cases, meningoencephalitis, five cases, peripheral neuropathy, five cases, encephalitis, five cases, and Guillain Barré syndrome, seven cases.

Lesions of infectious mononucleosis may also produce benign interstitial nephritis with albuminuria, a virus like pneumonia, or myocardial involvement.¹¹ The latter may be manifested by transient electrocardiographic changes consisting of lowering and inversion of the T waves in standard and unipolar leads, or prolongation of the PR interval.^{12, 13} In the lungs obstruction of the alveolar capillaries with alveolar distention plus perivascular and interstitial mononuclear infiltration have been observed.² Schultz and Hall¹⁴ recently reported three patients in whom the blood serum showed a significantly positive heterophil reaction and absent cold agglutinins and the roentgenograms showed unquestionable evidence of pulmonary involvement.

Infectious mononucleosis should always be considered in the differential diagnosis of "fever of unknown origin." In this respect, Rubenstein and Shaw¹ stressed the importance of differentiating infectious mononucleosis from brucellosis. Both diseases manifest similar signs and symptoms and may be characterized by an acute, subacute or chronic course. I recall one case involving a young man admitted to the hospital with fever and malaise. The physical findings were normal and he had no other complaints throughout hospitalization. A remittant fever of 101 to 103° F was present for two weeks. On about the twelfth hospital day his serum heterophil antibody and peripheral blood studies which previously were normal were significantly positive for infectious mononucleosis.

Thrombocytopenic purpura¹⁵ is another rare entity described in this disease and may cause some confusion with the other blood dyscrasias. Read and Helwig illustrated a drop in circulating platelets from above 300,000 to below 100,000 per cubic millimeter in association with the occurrence of petechiae on the body in three patients with infectious mononucleosis during the early course of the disease. Other observers, doing serial blood studies, noticed transient reductions of platelets and red blood cells during the initial stages of this disease without any

other clinical manifestations of blood disorder. Spontaneous rupture of the spleen is an infrequent but usually fatal complication reported in patients with infectious mononucleosis. These reports plus studies at necropsy² which reveal pathologic changes in every organ of the body make it easy to understand the variety of signs and symptoms that occur in infectious mononucleosis.

ACUTE HEMOLYTIC ANEMIA

Acute hemolytic anemia has been a serious complication recently described in patients with infectious mononucleosis. This finding is of particular significance because of the frequency of associating anemia and lymphocytosis with the diagnosis of leukemia. A review of the literature uncovered 10 patients who developed acute hemolytic anemia in association with infectious mononucleosis. Dameshek¹ reported a case in which the patient had received sulfadiazine. Spherocytosis, increased osmotic erythrocyte fragility and elevated urinary urobilinogen were noted along with the presence of autohemagglutinins active at from 40 to 72 °F. The administration of sulfadiazine may produce some doubt concerning the exact cause of hemolysis in this patient. In a report by Feldman and Jarvis, microspherocytosis, increased erythrocyte fragility and autoagglutination of red blood cells were similarly noted. Lymphatic leukemia with purpuric manifestations and bleeding gums was also present in this case but there was an improvement in the anemia and the heterophil antibody reaction reverted to normal after the acute febrile symptoms subsided. Riva described acquired hemolytic jaundice in infectious mononucleosis due to autoagglutination of red blood cell. Both autohemagglutinins and hemolysins were responsible for the acute hemolytic episode in a patient presented by Ellis and associates. Also in this latter patient the Donath Landsteiner test was positive without other evidence of syphilis. Appelman and Morrison reported acute hemolytic anemia in patients with this disease with a 25 percent spherocytosis and increased erythrocyte fragility to hypertonic saline. In another case reported by Wilson and others, no cause for the patient's acute hemolytic anemia was found but these authors suggested hypersplenism. Sawitsky and co-workers described a patient with an unusual case of infectious mononucleosis with generalized lymphadenopathy, hepatosplenomegaly, jaundice and acquired acute hemolytic anemia. A four plus positive Coombs test was obtained. The Coombs test became negative as the anemia disappeared and the patient recovered. Carroll and Hadley³ described a patient with acute hemolytic anemia with 1750 000 red blood cells, 23 percent reticulocytes and a serum heterophil titer of 1 696 (before and after absorption with guinea pig kidney). In 1951 P⁴ reported a case in which the patient de-

veloped an acute hemolytic crisis seven days after the onset of illness. The red blood cell count was 1 670 000. An initial white blood cell count of 24,000 with 76 percent neutrophils changed on the sixteenth day to 10 500 with 51 percent lymphocytes of which 46 percent were of the atypical form. More recently Huntington²² reported hemolytic anemia in an eight-year old boy in whom the serum heterophil antibody reaction and the Coombs test were both positive. He was treated with adrenocorticotrophic hormone (ACTH) and made a successful recovery.

THE HETEROPHIL ANTIBODY

In none of the preceding 10 patients in whom acute hemolytic anemia was reported, was there a history suggesting past hemolytic episodes. The establishment of a diagnosis of infectious mononucleosis was believed to be relatively certain and was based upon a significantly positive Paul Bunnell serum heterophil antibody reaction and a blood smear showing a classical marked relative lymphocytosis with a larger number of atypical lymphocytes²³ characteristic of the disease. Contratto stated that a positive heterophil reaction and a typical blood smear are so essential for the diagnosis that it cannot be made without them. A blood smear showing lymphocytosis with so-called atypical lymphocytes, although characteristic of infectious mononucleosis, is not as specific as the heterophil antibody reaction. Similar blood findings may occur in other diseases such as infectious hepatitis and infectious lymphocytosis. The heterophil antibody reaction is considered significant in a titer over 1:64. The height of the titer bears no relationship to the severity of the disease according to Cecil,²⁴ Kaufman²⁵ and Janeway and Dammin²⁶ reported false positive reactions in persons who had injections of horse serum in the recent past or had serum sickness. Kaufman also indicated that previous liver injections may cause a false positive reaction. Isolated cases of Hodgkin's disease and rubella²⁷ have been reported in the literature in which the patients have shown a positive heterophil reaction but no definite explanation has been offered. Lymphocytic leukemia has also been described as being associated with a positive heterophil reaction but in contrast, Feldman and Yarvis reported a patient with lymphocytic leukemia in whom the positive heterophil reaction became negative as the leukemia progressed. They attributed this to the concomitant presence of infectious mononucleosis. Kent²⁸ also described a case of unclassified leukemia in a 14 year old boy which resulted in death. The heterophil antibody was very strongly positive. Kent, however, expressed the belief that the simultaneous presence of infectious mononucleosis could not be ruled out. Schultz²⁹ studied the heterophil agglutinin titer in a total of 57 patients suffering from Hodgkin's disease, sarcoma, blood dyscrasia or tuberculosis. Diagnostic titers were

obtained in a significant number of these patients with no past or present evidence of infectious mononucleosis. Should such false positive heterophil titers be suspected lymph node biopsy and bone marrow studies would be of valuable assistance in a differential diagnosis.

Davidsohn presented an excellent evaluation of the heterophil agglutinin. He explained that normal persons and persons with serum sickness have heterophil antigens in their sera known as Forssman's antigen which will agglutinate sheep erythrocytes. The titer in normal persons is usually not higher than 1:32 but in serum sickness and in persons recently injected with horse serum the titer may rise to 1:64 or higher. With the use of guinea pig kidney Davidsohn could obtain 100 percent absorption of Forssman's antigen however in the presence of infectious mononucleosis absorption with guinea pig kidney did not significantly alter the heterophilic antigen titer. Davidsohn thus established that the heterophilic antigen in persons with infectious mononucleosis is unlike that in normal persons and in persons with serum sickness and that the test can be made more specific for the disease by absorption with guinea pig kidney. No other animal tissue in Davidsohn's study could produce 100 percent absorption of the so-called Forssman's antigen. A confirmatory test may be used by absorbing the patient's serum with boiled beef erythrocytes before the former is used to agglutinate red blood cells of sheep. Beef erythrocytes will absorb the heterophilic antigen due specifically to infectious mononucleosis.

Attempts have been made to detect heterophil antibodies in the spinal fluid of patients with significantly high serum titers but success has not always been attained. The small amount of globulin present in the cerebrospinal fluid may be of importance in the lack of relationship between heterophil antibodies in the serum and cerebrospinal fluid. Nevertheless Silberstein and others used a modified centrifuge technic to demonstrate the heterophil antibody in the cerebrospinal fluid of six patients with infectious mononucleosis. Heterophil antibody titers were recorded before and after absorption with guinea pig kidney and boiled beef erythrocytes. Only one of these six patients studied showed central nervous system involvement.

PHYSICAL SIGNS

In addition to pharyngitis lymphadenopathy and splenomegaly have been two physical findings most commonly associated with infectious mononucleosis. However Read and Helwig presenting a series of 300 patients reported 104 without palpable spleen and five without cervical or generalized lymphadenopathy. In Contratto's report of 196 patients 17 percent did not have peripheral lymphadenopathy and 53 percent did not have a pal-

pable spleen Stevens and associates² reviewed 210 cases of infectious mononucleosis and again emphasized that demonstrable lymphadenopathy need not always be present. Also in the latter report, only 43 percent of the patients had a palpable spleen. Philip,³ Morris and co workers,⁴ and Berte¹ reported a total of four patients with infectious mononucleosis with active symptomatology—but without palpable spleens or lymphadenopathy. Three of these patients also had jaundice and demonstrable liver impairment. Etcheverry⁵ described a type of infectious mononucleosis which he terms the "icteric type" without findings suggestive of the disease except jaundice, atypical lymphocytes, and a positive heterophil agglutinin titer.

BONE MARROW

Examination of the bone marrow in infectious mononucleosis has no specific diagnostic significance. Its main value is to rule out malignant lymphocytosis in patients with atypical disease. There are, however, certain characteristic changes that occur in the bone marrow in this disease. In 1945, Limarzi and others⁶ presented a series of bone marrow studies done on 25 patients with proved infectious mononucleosis. They demonstrated that the marrow in this disease was that of myeloid hyperplasia and immaturity. The myeloid cells were increased in number with a marked degree of granulopoietic immaturity, never going as far as myeloblastic hyperplasia. Megakaryocytes were normal or slightly increased in number. The ratio of the myeloid to the erythroid series averaged 3:0:1:0. In the presence of normoblastic hyperplasia associated with anemia, this ratio was 1:1:1:0. Normoblastic hyperplasia is a characteristic response of the marrow to hemolytic anemia.⁷

In a second report by Limarzi and associates⁸ in 1946 a review of the literature uncovered more than 65 case reports of bone marrow studies done on patients with infectious mononucleosis, the majority of which conformed to the findings originally described by Limarzi and others⁶ in 1945. In a few isolated cases authors described hypoplastic bone marrow, lymphocytic infiltration, or atypical lymphocytes in the bone marrow. In respect to the latter, an attempt should be made to guard against dilution with peripheral blood during the performance of a bone marrow aspiration. Israëls⁹ however, made reference to his personal experience of finding "glandular fever cells, early plasma cell types, and plasma blasts in the bone marrow in infectious mononucleosis even when care is taken to minimize admixture with peripheral blood.

It is of some interest to note that in Freeman's¹⁰ original discussion of the bone marrow in infectious mononucleosis he suggested the possibility that this disease may really be a benign

and abortive type of acute lymphocytic leukemia. Limarzi and associates have been the first group to make reference to this point and demonstrate that the bone marrow actually shows a lack of lymphocytic infiltration and that the atypical lymphocytes do not have the metastatic or replacement qualities of lymphocytes in leukemia and malignant lymphomas. Saunders and Adams, after administration of adrenal cortex extract and ACTH, studied the response of circulating lymphocytes in patients with infectious mononucleosis and in patients with chronic lymphatic leukemia. These hormones caused a drop in circulating lymphocytes in normal persons and in patients with infectious mononucleosis but not in patients with chronic lymphatic leukemia. These observations suggest further that there must be a basic difference between leukemia and infectious mononucleosis.

Hovde and Sundberg, using a different technique, studied the bone marrow of 93 patients with infectious mononucleosis and reported findings somewhat in contrast to the reports of Limarzi and associates.⁴⁴ In serial sections of aspirated marrow particles, granulomatous lesions were seen in those from nine patients and aggregates of proliferating lymphocytes were described on bone marrow films from the majority of patients. Although the marrow was primarily hyperplastic, there was a decrease in the neutrophil series in all patients with a shift to the left in most cases. In addition, Hovde and Sundberg reviewed 108 cases in the literature and compared the similarity of bone marrow findings in infectious mononucleosis with those of brucellosis, sarcoidosis, and tuberculosis.

THE PERIPHERAL LEUKOCYTES

The variations in the peripheral blood in infectious mononucleosis may be considerable. Although one usually expects to find the total white blood cell count between 5,000 and 15,000 per cubic millimeter, it may vary between 3,000 and 48,000 and in rare cases may reach 63,000. The differential count may show a polymorphonuclear leukocytosis early in the course of the disease which is eventually followed by a relative or absolute lymphocytosis. The neutrophils may also show toxic granules with a shift to the left.

It is easy to understand with these variations in leukocyte counts and manifestations how infectious mononucleosis may easily be confused with pyogenic infections or blood dyscrasias.

TREATMENT

The treatment of infectious mononucleosis still remains symptomatic and supportive. Investigations with aureomycin hydrochloride therapy were encouraging in early reports. Subsequent reports have indicated that the newer antibiotics do not alter

the course of the disease Schultz and Hall treated 76 patients with infectious mononucleosis with penicillin and 15 patients with aureomycin hydrochloride. They noted no reduction in cycle all duration of fever or symptoms as compared with a number of untreated control patients. Burnett and Milne¹⁵ treated eight patients with aureomycin hydrochloride and eight without drugs. These authors also noticed no difference in either group.

CONCLUSIONS

Infectious mononucleosis characteristically presents signs and symptoms which easily lead to a correct diagnosis confirmed by typical hematologic and serologic findings. Unusual manifestations, however, occur often enough so that infectious mononucleosis should be kept in mind whenever one is confronted with any febrile illness in which the clinical findings present a diagnostic problem. Rare hematologic features including acute hemolytic anemias may be associated with this disease and cannot be differentiated from the primary blood dyscrasias without serologic and bone marrow studies.

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IMMUNIZATION TO TETANUS

Only one case of tetanus has been reported among U S Army personnel in Korea during the military operation in that area. This was a nonbattle type of injury occurring as a result of a bulldozer accident. It was a nonfatal case occurring in an individual who though having received adequate basic immunization was not given an emergency stimulating dose at the time of injury.

—ARTHUR P LONG Colonel MC, USA
in *Industrial Medicine and Surgery*
p 276 June 1954

RESPONSE OF ALLERGIC PERSONS TO ORAL ADMINISTRATION OF AN EPINEPHRINE PRECURSOR

WILLIAM K. WOODARD, L. M. D., (MC) USN

IN an attempt to control some of the acute and chronic manifestations of the allergic state a new therapeutic approach has recently been offered by Widmann¹ and Widmann and Keye in the form of epinephrine precursors. This report presents a review of the literature and a description of the therapeutic response of 26 persons with varying manifestations of allergy to such a precursor.

DEVELOPMENT OF A PRECURSOR

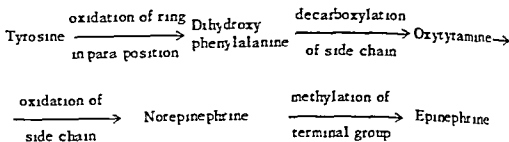
The ability of epinephrine to diminish or prevent many of the pharmacological effects of histamine among them hyperpermeability and selective smooth muscle spasm has long since made the drug one of the most valuable in the control of allergic disorders. The control of chronic allergic manifestations however remains a problem in spite of multiple therapeutic approaches.

Widmann and Keye observing certain well known similarities in allergic persons as a group pointed out that such traits as low to low normal blood pressure low to low normal metabolism asthenic body build tendencies toward flat glucose tolerance curves and general inability to adjust adequately to stress situations resemble and might possibly represent a chronic deficiency of the adrenal medulla. They postulated that the relationship between amino-acid metabolism and the adrenal medulla might be demonstrated by flooding the allergy afflicted human organism with natural precursors of epinephrine and they hoped that the organism could be altered beneficially by providing it with an increased reserve of available epinephrine when stress situations or antigen antibody reactions occurred.

Based upon the cumulative work of many investigators the known precursors of epinephrine were used in evaluating this concept. This combined research has resulted in the present opinion that tyrosine is one of the precursors of the epinephrine

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th U S N I R ing S d Off t N val Off P ur m Al
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series³⁻⁷ and that a phosphorylated derivative of pyridoxine acts as a necessary coenzyme in the conversion⁸⁻¹¹ Highly suggestive though not conclusive evidence for this lies in tissue slice experiments¹²⁻¹⁴ and in studies on the intact animal including the human¹⁵⁻¹⁷ In all instances in which tyrosine or a closely related precursor or derivative has been used a pressor substance has been isolated which has epinephrinelike properties and which is able to raise the blood pressure of cats This hypothesis has recently been confirmed by Udenfriend and associates,¹⁸ who demonstrated that the feeding of tagged phenylalanine and tyrosine to rats resulted in the tracing of both substances to the adrenals and epinephrine Based upon the work of Werle,³ Blaschko,⁴ and Holtz and Kroneberg,⁵ one of the presently accepted pathways of tyrosine metabolism is represented below



Tyrosine therefore was selected by Widmann and Keye as their starting point pyridoxine hydrochloride was added to serve as the coenzyme of the tissue decarboxylating enzyme tyrosine decarboxylase present in renal tissue⁴ and nicotinamide (niacinamide) was included because of its antihistamine properties²⁰⁻²¹ These were combined to form a tablet containing 200 mg of tyrosine 25 mg of pyridoxine hydrochloride, and 10 mg of nicotinamide²—hereafter referred to as "tyrosine nicotinamide pyridoxine compound"

Widmann and Keye then administered the drug to themselves in progressively larger doses with no evidence of toxicity As the compound was nothing more than a concentrated food product no toxicity was expected Since that time and over a four year period about 2 000 patients have been treated by them with no evidence of toxicity

DESCRIPTION OF TECHNIC

All patients in this series were dependents of military personnel stationed in Long Beach Calif Oahu Territory of Hawaii or Guam Mariana Islands Ages ranged from five months to adulthood the majority of patients were children Most of the patients had received "allergic work ups" and for the most part were poorly controlled with existing medications A detailed history and physical examination was done and laboratory tests indicated were carried out All cases of vasomotor rhinitis

examined by a competent otolaryngologist for confirmation of the diagnosis. The patients were studied over one and one-half years but, being dependents of military personnel follow up studies were often curtailed prematurely. Patients were not accepted into the series however unless in all probability they would be in the given area for at least six months. Placebos identical to the tyrosine nicotinamide-pyridoxine compound were given to those patients deriving an excellent response and were used for a two-week period without the knowledge of the parents.

Dosage varied as to the age group. Infants and children to two years of age were given from one to three tablets four times daily. Children from two to six years of age received from two to eight tablets four times daily essentially the same as the adult dose. The tablets were administered before meals and at bedtime. Table 1 indicates the type of allergy and result of treatment.

EFFECT ON ASTHMA

A total of 34 patients were treated with 29 showing definite improvement. Of this group seven patients had no further asthma while taking the tyrosine nicotinamide-pyridoxine compound. Whereas only one child under the age of seven failed to respond there were four failures in children over seven. Improvement occurred in 88 percent of treated cases.

Two patients in status asthmaticus refractory to epinephrine and aminophylline were treated with the compound alone being given eight tablets four times daily. Both were young men not included in this series. Subjective improvement occurred within an eight-hour period in both patients and one improving rapidly became asymptomatic within two days. The other patient continued to be dyspneic and responded only to a combination of many medications.

CASE REPORTS

Case 1. Due to severe asthma this six year old girl was flown to our clinic on 26 February 1952 from Norfolk Va. Attacks of asthma had begun soon after birth but these were occasional and the child had enjoyed normal growth and development in California. At the age of three the child was taken to Norfolk where she immediately became worse the attacks coinciding with upper respiratory infections. About six months of the past year had been spent in the hospital with severe asthma. Prior to her arrival in California she was a hospital bed patient for 37 days. Upon reaching California some improvement occurred. No wheezing decreased vomiting and greatly increased well being were noted. Physical examination revealed a pallorous

TABLE I

Type of allergy	Treated	Improved			Not Improved
		Excellent	Moderate	Minimal	
Hay fever seasonal	1	1			
Hay fever perennial	15	4	4	1	6
Bronchial asthma under age seven	21	7	13		1
Bronchial asthma over age seven	13		9		4
Allergic rhinitis	4	2			2
Generalized urticaria	1	1			
Drug eruptions	1	1			
Total	56	16	26	1	13

Excellent improvement in 16 cases, moderate in 26, minimal in 1, and no improvement in 13 cases.

thin sickly looking child with some increase in the anteroposterior diameter of the thorax. The chest was clear and the remainder of the examination was not remarkable. Laboratory tests showed the white blood cell count to be 8 100 with normal differential hemoglobin 10 gm red blood cell count 4 14 million and erythrocyte sedimentation rate 11 mm/hr. The family history was strongly positive for allergy her mother had hay fever and one sibling was asthmatic. Diabetes was present in all four grandparents. The patient was given a multivitamin preparation and phenobarbital elixir. When next seen two weeks later severe asthmatic attacks had occurred several times. On 25 March 1952 the child was placed on the tyrosine nicotinamide pyridoxine compound two tablets four times a day. Within 48 hours minor wheezing episodes occurred only rarely. Because of these episodes however the dosage was increased to 10 tablets daily in divided doses. All wheezing ceased appetite returned and the patient gained five and one half pounds in six weeks. On 19 May 1952 the patient was placed on a placebo identical with the original medication. She immediately grew worse and when seen on 9 June 1952 had again lost her appetite wheezed constantly and was most miserable. Prompt alleviation of symptoms occurred when the compound was again started. She continued to do well on this medication felt better than at any time in three and one-half years and was an active happy child.

EFFECT ON ALLERGIC RHINITIS

A total of 16 patients were treated with ten improved and six unimproved. A routine nasal smear for eosinophils was made prior to beginning treatment and each patient was seen by the otolaryngologist to substantiate the diagnosis. The only patient with seasonal rhinitis treated began the tyrosine nicotinamide pyridoxine compound in the middle of the pollen season became asymptomatic within two days and remained so during and after 30 days of therapy. The dosage given was four tablets four times a day. The patient included in the present series as showing minimal improvement was treated for a period of one week with out objective changes. She did not return to the clinic.

Of all patients treated those with vasomotor rhinitis were most refractory. When the series was initiated patients were given two tyrosine nicotinamide pyridoxine tablets four times a day with little or no improvement. They were then instructed to begin their course with two tablets four times a day then increasing each dose by one tablet daily to improve the therapeutic effect. Under this regimen failures responded to change in the successful treatment over a two- to three-month period.

mucous membranes with enlarged turbinates to a normal salmon pink color with an actual diminution in size of the turbinates. In patients responding satisfactorily, accentuation of symptoms following two days of therapy was almost invariably present, and represented a favorable prognosis. The number of eosinophils seen on routine smears of nasal mucus was also a valuable prognosticator—the more eosinophils, the better the response. Therapeutic failures also were refractory to antihistaminics and to both specific and general desensitization procedures. Scratch tests on the failures invariably revealed multiple sensitivities.

Case 2 A seven and one half year old girl, who had had a runny, stuffy nose since four years of age entered the outpatient clinic because the Long Beach, Calif. climate had aggravated her condition. Scratch tests were highly positive only for dog hair, wool, and house dust. Desensitization procedures had proved ineffective. The family history was not contributory. Physical examination disclosed obstruction of the nares by pale edematous mucous membranes and enlarged inferior turbinates, completely blocking the nasal airways. The remainder of the physical examination was essentially negative. On 25 July 1952 the patient was placed on a regimen of three tablets of tyrosine nicotinamide pyridoxine compound four times a day. Nasal smear prior to treatment revealed two eosinophils per high power field. On 1 August 1952 she was completely asymptomatic for the first time in three years. Inferior turbinates had decreased in size restoring a nasal airway. On 8 August, while on the same dosage of the compound, a rather violent exacerbation of previous symptoms occurred. Dosage was increased to four tablets four times a day, with prompt subsidence of symptoms. On 22 August the date of the next appointment she had remained asymptomatic and the medication had been decreased to three tablets four times a day. She has continued on the compound to the present time.

EFFECT ON ATOPIC ECZEMA

Of the four patients treated, two became rash free, however both patients showing improvement had only mild cases of patchy eczema in antecubital fossae and on the face. Severe generalized eczema as seen in the two failures did not respond whatever and due to the small number of patients no conclusion is warranted.

Case 3 This five year old girl was first seen on 4 June 1952 because of eczema since birth. As an infant she had had known sensitivities to egg, wheat and milk. The skin had never been completely cleared. The family history disclosed that her mother had been similarly affected as a child and her father had perennial rhinitis. Examination revealed a scalp, erythematous, rough

ened skin over the cervical area adjacent to the posterior hair line, and similar areas were present in the popliteal and ante-cubital fossae. Histar ointment had been used but without success. This was continued and the patient was given two tablets of the tyrosine nicotinamide pyridoxine compound four times a day. On 18 June 1952 the skin was no longer rough. Both ante-cubital and popliteal areas were slightly erythematous but the skin was soft and smooth; the cervical area had cleared entirely. When the dosage was increased to three tablets four times a day these erythematous areas cleared also. During the six month follow up there was no recurrence.

EFFECT ON GENERALIZED URTICARIA

An 18 year old youth who had suffered with daily giant urticaria for two months without discernible cause became rash free on four tablets of the tyrosine nicotinamide pyridoxine compound four times a day. When the patient's symptoms promptly returned upon subsidence of therapy he was hospitalized elsewhere for investigation and contact with him was lost.

EFFECT ON DRUG ERUPTION

A healthy three year old boy was given elixir of phenobarbital while he was accompanying his family to a new duty station. When seen the child had a brawny erythematous slightly pruritic rash generalized in distribution. Due to the lack of associated signs and symptoms of systemic illness it was attributed to phenobarbital. The child became rash free within 24 hours after being given two tablets of the tyrosine nicotinamide-pyridoxine compound.

DISCUSSION

The classical therapeutic approaches in the treatment of the allergic state have been (1) removal of the offending allergens, (2) hyposensitization against known specific allergens, and (3) nonspecific hyposensitization measures. Widmann and Keye offered an approach partially encompassing all three. If their concept in part based on an adrenal medulla insufficiency is valid, one should be able to find examples in the literature of faulty tyrosine metabolism in which a strong history of allergy is present. Such cases are lacking but the rarity of the condition could conceivably be the reason. One of the characteristics of patients suffering from phenylpyruvic oligophrenia, however, in which the chemical defect is a failure to oxidize phenylalanine to tyrosine, is a patchy eczema giving further support to the theory that allergy is related to amino-acid metabolism and the physiologic production of epinephrine.

The beneficial effects of adrenocorticotrophic hormone and cortisone on allergy may be related to the effect of the tyrosine-nicotinamide pyridoxine compound in that increased epinephrine production with subsequent stimulation of the hypothalamus and anterior pituitary could result in greater production of ACTH and cortisone. The results obtained in this study therefore, might be due to a minimal increase in ACTH and cortisone.

In about 2 000 patients treated with the above compound Widmann and Keye observed beneficial results in vasomotor rhinitis, bronchial asthma, pruritic skin lesions drug sensitization, histamine headache, and trifacial neuralgia. Functional hypoglycemias with associated hypotension likewise responded to medication. In one series of 492 patients, improvement occurred in 356 (72 percent).² The present series is extremely small, but the results which show 77 percent of patients improved, are comparable to the larger series. I believe that any measure in the management of allergy responsible for such improvement warrants further investigation.

SUMMARY AND CONCLUSIONS

A recent concept of the origins of allergy which holds that subclinical adrenal medulla insufficiency may be contributory to the allergic state is reviewed. It is believed that the correction of such an insufficiency by the oral ingestion of the epinephrine precursor tyrosine, is theoretically possible. The response of 56 patients with various manifestations of allergy to the amino-acid tyrosine showed an overall improvement of 77 percent. Tyrosine nicotinamide-pyridoxine compound is at least a useful adjunct in the therapy of allergy and warrants further investigation.

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LOWERED TUBERCULOSIS RATE

The 50th annive ry of the Nat l Tuberculosis Association this
year marks a milestone in the o g n zed mp gn ag inst the d ease
At the beg nning of the century tuberculosis was the lead ng cause of
death in our country It was th n p rticularly r mp nt n the congested
areas of our rapidly growing c ties and took ts h vie t toll am g
men in early ad lt life creati g widespe ad widowhood nd ph
ho d

In the half c ntury nce the antituberculosis camp ign was l unch d
ext ord y pr gr ha been made in the contr l of the d e se
The tube cul s death rate in the United St te d pped fr m 183 9
pe 100 000 in 1900-1903 to 12 6 in 1953 the r te will p obably fall
to about 10 pe 100 000 in 1954 Whereas the d e as outr nk d ery
other caus f de th t the turn of the century it has since be n
redu ed to tenth pl ce t the me time its toll has decre s d from
11 perce t to l tle mor than ne pe cent of all deaths

F m St t t l B llet
p 1 Ap l 1954

PROTHROMBIN DETERMINATION AT 4° C

Its Use as a Bedside Test

A DAVID ETESS, *Lieut nant (MC) USNR*

LEON N SUSSMAN *Lieut nant Commander (MC) USNR*

IN the study of various phases of prothrombin determination, we have been impressed with the effect of temperature on prothrombin time

Popular methods for the performance of this determination have been instituted by Quick,¹ Warner and associates² and Shapiro and associates.³ All of these methods, and the micromethod recently introduced by Isenbarg,⁴ are done in a constant-temperature water bath at 37° C. Kato's⁵ microprothrombin test with capillary whole blood, and the method advanced by Goldfeder and associates⁶ are done at room temperature. They performed 76 prothrombin determinations on Swiss mice and reported means of 28.4 seconds at a room temperature of 23° C, 24.9 seconds at 26.5° C, and 22.9 seconds at 28.5° C. This supported the view that a reduction in the temperature at which prothrombin determinations are performed prolongs the prothrombin time.

We therefore chose to study the prothrombin determination in ice water. It was found that as long as ice was present in the water bath, a reliably accurate temperature between 2° C and 4° C could be maintained.

Using the Link-Shapiro modification^{7, 8} of the Quick one stage method, 198 oxalated samples of whole plasma were subjected to prothrombin determination at 37° C in a constant-temperature water bath. Duplicate determinations were made and the average obtained. The identical procedure was then repeated on the same specimen of whole plasma at 4° C in an ice water bath. The specimens studied had been submitted to the chemistry laboratory for prothrombin determination, and included blood samples from patients receiving anticoagulants predominantly bishydroxycoumarin (dicumarol). One hundred and fifty-two prothrombin times were likewise simultaneously obtained at 37° C and 4° C on whole blood. The materials used were M/10 solution of sodium oxalate, M/200 solution of calcium chloride, thrombin (thromboplastin) 0.85 percent sodium chloride solution, and barium sulfate, C P.

From Blood Chemistry Laboratory, Naval Hospital, Naval Air Station, Jacksonville, Fla.

PROCEDURE

Four and one half milliliters of freshly drawn blood were added to 0.5 ml of M/10 sodium oxalate solution. Clear plasma was obtained by centrifugation and divided into two parts. 0.1 ml of whole plasma at 37 C taken from the first part was added to

Percent Prothrombin Concentration

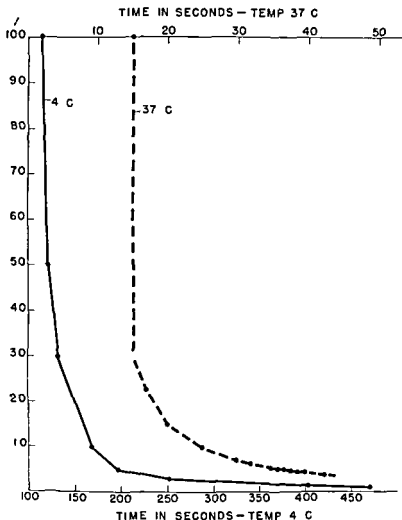


Figure 1 Comparison of prothrombin concentration at 37 C and 4 C.

0.2 ml of thrombin calcium chloride mixture (also at 37 C) and the time of clot formation was noted on a stop watch. Then 0.1 ml of whole plasma at 4 C from the second part was likewise

added to 0.2 ml of the thrombin calcium chloride mixture (at 4 C), and the time of clot formation noted

RESULTS

Employing barium sulfate prothrombin free plasma as a diluent, plasma prothrombin concentration curves were obtained at 37 C and 4 C (fig 1). These indicated that the relationship of prothrombin concentration to prothrombin time remained unchanged regardless of whether the determination is performed at 37 C or 4 C.

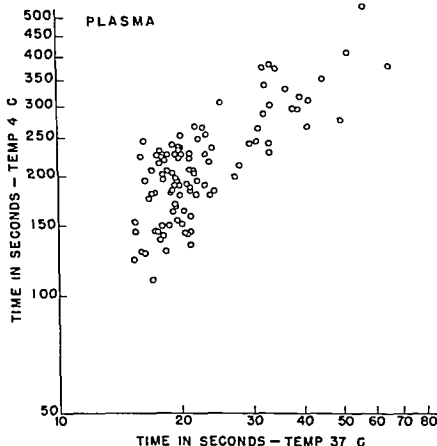


Figure 2 Logarithmic scatter of prothrombin determinations on whole plasma at 37 C and 4 C.

The remainder of the results are represented graphically in figures 2 and 3. These scatter diagrams were obtained by plotting logarithmically along the abscissa the prothrombin times on the same specimen of whole plasma (fig 2) and whole blood (fig 3) at 37 C and along the ordinate the prothrombin times at 4 C for plasma and whole blood. Examination of these diagrams reveals that a constant relationship exists between prothrombin determinations at 4 C and 37 C. This relationship is stronger for plasma than it is for whole blood.

In order to corroborate further the conclusion that the variables are related the data on the whole plasma was subjected to statistical analysis by application of the analysis of variance

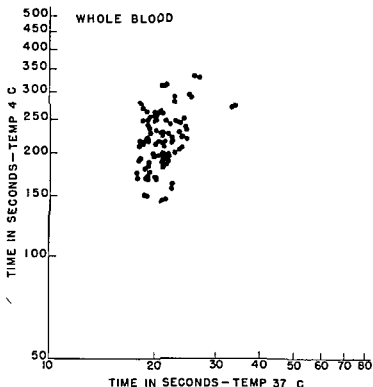


Fig 3 Logarithmic plot of prothrombin time at 37 C and 4 C

technic. Arbitrarily subdividing the data into four groups of prothrombin times at 37 C (15.0 to 19.9, 20.0 to 29.9, 30.0 to 39.9, and 40.0 and over) we found that the corresponding prothrombin times at 4 C increased significantly. Analysis of the variations within the groups, however, revealed no significant increase in magnitude (table 1).

DISCUSSION

Whether the conversion of prothrombin to thrombin is a stoichiometric or enzymatic reaction, reduction in temperature at which the reaction occurs prolongs the time of clot formation.

The advantage of performing the prothrombin time at 4 C rather than in the conventional manner lies in the relative slowness of the clotting reaction at this temperature. This enables one less skilled to determine the end point with greater efficiency and accuracy because the reaction occurs over a period of minutes.

rather than seconds. The simplicity of materials and equipment permits the bedside determination of prothrombin time at 4° C. For convenience, the blood is oxalated and the prothrombin determination performed on the plasma, but it has been demonstrated that the prothrombin time can be applied to whole blood,* thereby obviating the need for a centrifuge.

TABLE 1

Prothrombin times at 37° C. in seconds	Arithmetic mean for corresponding prothrombin time at 4° C.	Standard deviation at 4° C. in second	Number of cas
15.0-19.9	191.3	36.3	94
20.0-29.9	207.5	44.1	31
30.0-39.9	303.5	46.5	15
40.0 and over	358.3	84.6	7

The prothrombin time is more accurate for plasma than it is for whole blood. This may be ascribed to the varying hematocrit

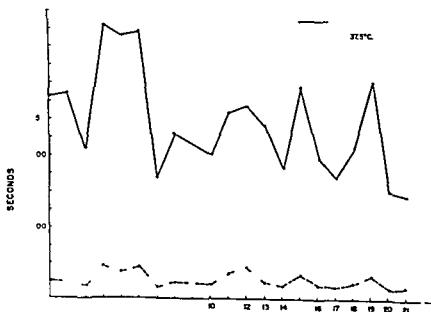


Fig. 4. Prothrombin times at 37.5° C. and 4° C. in a patient receiving bishydroxycoumarin.

values of whole blood samples, hence low hematocrit values would indicate greater plasma volumes per aliquot of whole blood. Patients receiving bishydroxycoumarin can be followed by pro-

In order to corroborate further the conclusion that the variables are related the data on the whole plasma was subjected to statistical analysis by application of the analysis of variance

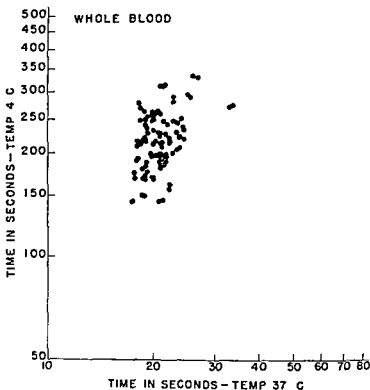


Fig 3 Logarithmic atte of pr thr mb det rm t on whol bl od t 37 C and 4 C.

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DISCUSSION

Whether the conversion of prothrombin to thrombin is a stoichiometric or enzymatic reaction reduction in temperature at which the reaction occurs prolongs the time of clot formation

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DETERIORATION DURING STORAGE OF ALGINATE HYDROCOLLOIDAL DENTAL IMPRESSION MATERIAL

KENNETH R. PFEIFFER D D S

JAMES L. HARVEY B S

GERHARD M. BRAUER Ph D

THE hydrocolloid, alginate type dental impression materials* were introduced during World War II as a substitute for the then scarce agar agars. They have gained increasing favor because of their ease of handling and accuracy of reproduction.

The physical properties and clinical behavior of these materials have been studied by Skinner and Pomes,¹ Cresson,² Worner,³ and Schoonover and Dickson.⁴ One of the serious difficulties encountered in their use has been their tendency to deteriorate during storage. Two distinct types of aging failure have been observed. In some cases the material, after storage for a short time at ordinary temperatures, will not form an insoluble elastic gel. Schoonover and Dickson showed that this was caused by the removal of the retarding agent by premature reaction with the compounds added to convert the soluble gel into the insoluble form. This type of difficulty is readily overcome by proper compounding of the mixture and is no longer a serious factor. The second type of failure is observed most often when the materials are stored at elevated temperatures and has been particularly noticeable when these materials are shipped to and stored in tropical areas. Materials subjected to these conditions often have inferior physical properties. The strength of the gels is greatly reduced, their setting time is altered, and the accuracy of the reproduction is inadequate for dental use. Experimental data obtained in this investigation show that this type of deterioration results from degradation of the alginate polymer at elevated temperatures.

EFFECT OF TEMPERATURE ON DETERIORATION

Samples of five commercial brands of alginate impression materials commonly supplied military dental clinics were bought

* From Dec 1 R. L. Harvey, National Bureau of Standards, Washington, D. C.
 1. Pfeiffer is now at the U. S. Army Dental Clinic, Durham, N. C.
 2. S. K. 5-362-500, Army Service Catalog of Medical Materials, 1315

on the open market before 1951 and were stored in the packages as received, at 21 C and 60 percent relative humidity and at 37 C 50 C and 65 C at relative humidities of less than 60 percent. At the end of one month samples of each material were removed and their setting time permanent deformation compressive strength ease of manipulation and gel forming characteristics were determined. The measurement of these properties provides a satisfactory means of following the extent of degradation the compression test appears to be the most useful. This procedure was repeated on other samples stored at 50 C for three and one half months. The method described in American Dental Association Specification Number 11 for hydrocolloidal impression materials⁴ was used to determine setting time. The permanent deformation was determined by the method described by Cresson. The compressive strength was determined on cylindrical specimens about 0.5 inch in diameter and 0.75 inch in height loaded at a head speed of 0.20 inch per minute on the testing machine until rupture occurred. These specimens prior to crushing were stored for one hour at 21 ± 1 C under conditions approximating 100 percent relative humidity. The gel forming properties and ease of manipulation were determined by making mixes of the material and observing the general characteristics of the mix.

The data obtained are given in tables 1 and 2. It will be observed from these data that only small changes if any occurred in any of the materials stored at 37 C for one month when compared with those stored at 21 C. After one month's storage at 50 C, a marked reduction in the compressive strengths was observed. The deterioration was more pronounced after storage for three and one half months at 50 C and resulted in a loss of strength of from 25 to 45 percent. Storage at 65 C produced such rapid deterioration that most of the products failed to set after one month's storage at this temperature and were unsuitable for use as impression materials.

In order to determine the effect of extended storage under temperature conditions likely to be encountered for the materials another series of specimens was stored for 30 months in an unheated storage room (temperature range about 5 to 50 C). Properties of two compounds changed little (table 2) and these materials were considered satisfactory for general use after storage under these conditions. A third impression compound did not set after storage under the same conditions. This material did not change appreciably on storage at 21 C for the same length of time.

The failure to set and the resulting loss in strength do not appear to be caused by oxidation of the organic alginate because

Table 1 Effect of storage temperature on properties of hydrocolloid, alginate type 12s impression materials

Table 1. Effect of storage temperature on properties of dental impression materials.													
Material	Exposure (months)			Permanent deformation after 12 months (percent)						Compression strength (lb per sq in)			Reduction in strength after 3 1/2 months at 50°C (percent)
	1 month			1 month			1 month			1 month			
	3 1/2 months			3 1/2 months			3 1/2 months			3 1/2 months			
	21°C	37°C	50°C	21°C	37°C	50°C	21°C	37°C	50°C	21°C	37°C	50°C	
Cele-Loid	5	5	5	7	18	17	20	—	—	21	45	—	40
Dental Impression	5	5	5	8	23	23	23	38	21	151	134	12	25
Alginate	5	5	5	6.5	30	34	37	—	—	41	76	—	45
Alginate	4	4	4.5	6	21	22	27	—	—	22	26	—	38
Dental	4.5	4	4	3	15	13	16	—	—	19	50	—	30

Minimum and maximum values of variation 6.6 percent

Minimum and maximum values of variation 4.7 percent

Is-filid

NOTE: Specimen of Cele-Loid Kalginate dMycorchg dcol rewe tested at 65°C (149°F)

impression materials stored under nitrogen and heated deteriorated in a similar manner and at about the same rate as the materials exposed to air during heating. The possibility of microbiologic action was rejected owing to the highly alkaline nature of some ingredients of the impression compounds and to the fact that no microscopic evidence of such action was apparent in the deteriorated powders. The inorganic salts and fillers used in compounding these materials are usually heat stable at the temperatures of storage. Fillers used in the formulation of the impression compound described by Schoonover and Dickson were mixed and dried to constant weight over phosphorus pentoxide (phosphoric anhydride). On storage at 65° C for one month no loss in weight of the fillers took place.

TABLE 2 Deterioration of hydrocoll dental alginate type 12 impression materials after 1 g./30 months

Material	Laboratory storage conditions	Setting time (minutes)	Permeability (per cent)	Compressive strength after 1 hr. (lb per sq. in.)
Dental impression compound	Tested after 30 months at 5-50° C.	3 2/3 4	2.3 2.8	121 123
Kalgis	Tested after 30 months at 5-50° C.	2 1/2 2 1/2	2.2 2.3	80 86
Zel	Tested after 30 months at 5-50° C. 30 months at 21° C.	3 1/2 Did	1.3 1.8	61 56

Maximum standard deviation = 0.09 maximum coefficient of variation 4.1 per

Maximum standard deviation 1.1 maximum coefficient of variation 6.7 per

Keep in unbroken to glass room.

Keep at temperature room 60 per 1 humidity

Loss of the gel forming properties during storage is more likely to be associated with a change in the alginate component of the impression material. Sodium alginate is a linear polymer of the sodium salt of anhydro-beta-D-mannuronic acid of colloidal dimensions having recurring units of the formula CHO and containing one carboxy and two hydroxy groups. The structure of alginic acid thus contains acid groups which decarboxylate (decompose with loss of carbon dioxide) almost completely at temperatures above 200° C.² Dry sodium alginate shows no change in weight on storage at 65° C. No evolution of carbon dioxide or noncondensable gas was observed on storage of impression compounds at 65° C. although the samples showed the usual deterioration. Hence decarboxylation is not a likely cause for this change.

In order to determine whether the deterioration is due to a reduction in molecular weight (depolymerization) of alginic acid, which normally has a molecular weight of about 15,000, samples of sodium alginate were dried to constant weight and then stored at $50 \pm 2^\circ \text{C}$ and $65^\circ \pm 2^\circ \text{C}$ for seven weeks. At the beginning and periodically throughout the storage period, samples of the alginate powder were removed and dissolved in water, and the viscosity of the solutions was determined. The

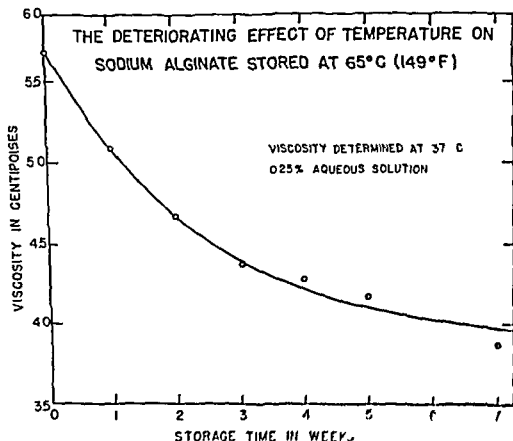


Fig. 1

solutions were made by adding 0.2 gram of alginate to 100 ml of distilled water. The viscosity measurements were made at $37 \pm 0.5^\circ \text{C}$ in a calibrated Ostwald-Loske viscosimeter. The results of storing for seven weeks at 65°C are shown in Figure 1. The viscosity decreased with increasing storage time and was reduced by about 30 percent during this period. In storage at 50°C the decrease of the viscosity was considerably less but still observable. After three and one half months the viscosity was reduced by 10 percent. The decrease in viscosity was attributed to depolymerization of the alginate at elevated temperatures.

A decrease in the viscosity of aqueous solutions of sodium alginate on standing has recently been observed by Diaz and Aeulle.¹³ The authors also attributed this phenomenon to depolymerization of the dissolved alginate. The depolymerization appears to be a chain reaction because Diaz observed that it is inhibited by phenol, a typical chain terminator. The depolymerization may take place by an exclusive breaking of terminal links or a random scission (i. e. all bonds are split with equal ease). Either mechanism leads to products of lower molecular weight.

SUMMARY AND CONCLUSIONS

Alginate hydrocolloidal impression materials deteriorate rapidly at elevated temperatures. Materials stored for one month at 65° C were unsuitable for dental use and either failed to set or showed increased setting time and greatly decreased compressive strength. At 50° C these materials also deteriorated but at a much slower rate. No appreciable change was observed in materials stored at 37° C.

Deterioration of the alginate impression materials is caused by depolymerization of the alginate constituent.

Alginate impression materials should not be stored for prolonged periods at temperatures above 37° C.

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HEALTH AS THE FIRST LINE OF DEFENSE

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Surgeon General of the Navy

WHILE health is an entity about which there has been much philosophizing and the importance of which has been both generally and pointedly recognized, actually there is a proneness upon the part of the human race to take it more or less as a matter of course and to really realize its importance, not so much by reason of its being possessed as by reason of its being lost. When one comes to consider the estimate accorded its import by men of wisdom, the views of two individuals seem particularly worthy of being cited. One, the declaration of England's great nineteenth century Prime Minister Disraeli, who observed that "The health of the people is really the foundation upon which all of their happiness and all of their powers as a state depend," and the other that of a twentieth century philosopher, Will Durant, who in his treatise entitled "What is Civilization?" stated that "The health of nations is more important than the wealth of nations." It is from this keynote that I desire to take my text.

While I have spoken of the inclination of people to take it for granted it is nevertheless interesting to point out that at the close of World War II in the year 1945, a poll was taken in America by an agency engaged in the sampling of public opinion, and one of the questions contained on the questionnaire submitted was designed to obtain information as to what people had been most thankful for during the year then drawing to a close. It was generally assumed I believe, that the majority would have answered that they were most thankful for the war's having ended. This was not to be the case however, for of the number responding to the questionnaire, 52 percent far and away the greatest number expressing a unanimity of opinion, said they were most thankful for health, while only 18 percent of those responding to the questionnaire gave the termination of the war as the condition for which they were most thankful.

ECONOMIC ASPECT OF HEALTH

Health not only makes a great difference to the individual but to society and, from a coldly materialistic viewpoint, to society.

from an economic standpoint. The debit upon the ledger of productivity cannot be reckoned solely in terms of the loss of individuals singly when for reasons of health they are incapacitated for engaging in their normal pursuits. account must also be taken of those whose time and energies must be devoted to their care. In the armed services of America the ratio of staff to patients in general hospitals is from one and one quarter to one and one half to one. In other words one and one quarter to one and one half well people are required to take care of one sick person. The ratio is two or more to one in civilian hospitals.

The maintenance of health or the prevention of disease and injury was for long inadequately stressed in medical school curricula in the United States and unless there has been a recent radical change it is still inadequately stressed. As late as 10 years ago about one third of the 72 medical schools then in existence in America did not regard preventive medicine of sufficient importance to devote any time to it in the regular curriculum while 21 schools devoted a limited time to it in connection with some other course and only 32 ascribed to it sufficient importance to give it separate and distinct identity.

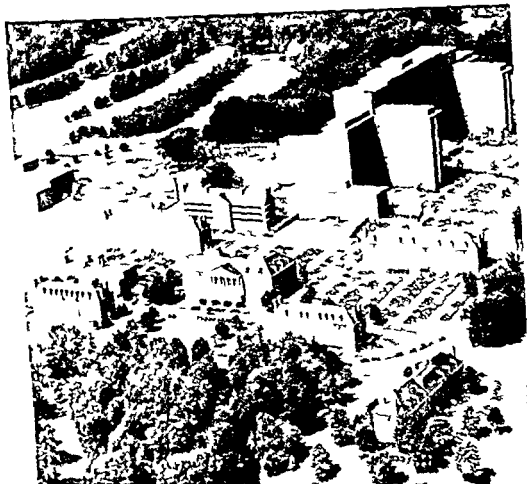
Health plays a major role in the standard of living of any nation. There is no doubt that its importance has of late come to receive more nearly the recognition due it. The existence of the many health agencies and edifices now in being is a manifestation of this recognition. Witness for example the magnificent group of buildings that house the National Institutes of Health at Bethesda just north of Washington, D C in Maryland. The creation in 1946 of a World Health Organization is additionally pat to the point.

LIVE MORE AND LIVE LONGER

An individual is considered normal only when in a state of health. Any departure from it must be regarded as a departure from normal. It seems worthy of being pointed out albeit that health cannot necessarily be accurately defined as merely the absence of disease or infirmity but rather there must be taken into account the individual's complete physical mental and social well being and that there are varying degrees of health. Therefore it is not merely a static state to be maintained but is one that lends itself to improvement. In fact the philosophy of living more is in my estimation on a par in importance with living longer. Thus does it follow that a healthy individual not only stands a better chance of living longer but no less better a chance of living more.

There are several interesting and at the same time significant points which bear upon the entity of health. One is that the

natural trend throughout the normal life span of all living things, I believe, is toward health. Normally functioning physiological processes of the human being tend toward a state of health, as witness recovery following acute illness and repair following trauma or tissue destruction. A second noteworthy and fortunate thing about health is that its promotion and preservation may in



THE NATIONAL INSTITUTES OF HEALTH BETHESDA MD

In this aerial view the Clinical Center is at the upper right, the Administration Bldg, center and the National Cancer Institute in the right foreground.

so large a measure be favorably influenced by natural and gratuitous circumstances or elements, such as fresh air and sunshine. Thirdly, it is interesting and at times astounding to consider how man, the most intelligent of all animals, is more prone to indulge in excesses and practices he well knows to be detrimental to his health than any other creature. Man can certainly clutter up his immediate surroundings too as quickly and as completely as any other animal, and his state of personal hygiene and cleanliness, if not closely attended, will with amazing promptness become loathsome.

EFFECT OF DISEASE ON HISTORY

I think there is no more effective way of emphasizing the importance of health than by pointing out how its absence or lack has affected the course of history. One is well within the mark, it is believed, when he undertakes to show that factors of health or its opposite, disease, however one chooses to consider the matter, have played a more important role in shaping the destiny of the human race, the course of history if you please, than has war or the machinations thereof.



THE PLAGUE

After the engraving by Gerard And (1640-1703) after Pierre Mignard. (From the Library of Congress, Washington, D. C.)

In earlier centuries the weakness of unscientific medicine profoundly affected political, economic, and social world trends. Disease has played both hero and villain and has effected both comedy and tragedy in the drama of the human race. The failure to control disease has often governed the course of empires. Thus, according to authenticated history, schistosomiasis had so debilitated Egypt by the thirteenth century B. C. as to permit the Jewish race to escape their vassalage and to make later their great independent contributions to thought and morals. Plague hurried the dissolution of the great culture of ancient Greece and the full benefits of Greek philosophy and knowledge were consequently lost to mankind for a thousand years. Pericles and the golden age of Athens succumbed not to man but to the

plague which, in a period of two years, destroyed more than one third of its population of 300,000. The dissolution of the Roman Empire was occasioned not only by the destructive forces of war and internal weakness but was unquestionably hastened by the great plague which raged in the third century for a period of 15 years and reduced the city population of the empire by one half. Plague, smallpox, typhus fever, typhoid fever, cholera, and malaria have struck indiscriminately at country after country, at pagan and Christian, kings and beggars, masters and serfs alike. Pestilence staved the advance of the Hun into Western Europe and permitted Christianity, with its concept of the dignity of man to spread throughout Europe. Pestilence attacked Byzantium spurring on the Arabs who were thus enabled in the name of Allah to penetrate Europe. Pestilence frustrated the efforts of the Crusaders to spread the Christian creed along the Mediterranean and allotted to Christians the thorny crown of disease and infection instead of the Holy Sepulcher.

During man's entire existence he has struggled not only to adapt himself to his physical environment but also he has had to overcome the powerful opponents—war and disease. Today the armamentarium of the physician is better than it has ever been. It is vastly superior to that of even a few years ago but it is still not all that we would like. We appear to be winning our struggle against disease and we hope that in the not so distant future man's evolution will not be only a matter of physical adaptation but also a matter of spiritual progress—an ideological freedom. There are those who would contend that there are no incurable diseases but only some for which man has not yet found the cure. The history of human progress, it will be observed in passing is a history of ideas and an expression of reaction relative thereto.

FIRST RESPONSIBILITY OF MILITARY MEDICINE

The importance of health is nowhere greater than in the military. A cardinal purpose of military medicine has always been to conserve manpower and to promote and preserve the health of military forces. I count the prevention of disease, the keeping of personnel well and whole to be indeed the first responsibility of the medical departments of the armed services. With the advent of the current concept of war it cannot be gainsaid, however, that health is any less important in civilian populations than in the military. Therefore it becomes apparent that a country's first line of defense is the health of its citizens. The extent to which the importance of the specialty of industrial medicine has been recognized and developed in recent years is an attestation of the appreciation with which this fact is sensed. It is interesting to contemplate how the more industrialized a nation becomes

the closer is the producer brought to the consumer in terms of a common interest

A consideration of this resource as a medium through which not only the people of one nation but the populations of a group



AESCULAPIUS THE PHYSICIAN AND TELESPHORUS

A s lap us d g t G k myth l gy was l by Z us wh wa
f f l h m ght mak ll m mmortal T l phorus ft wor h pped
w th A ulap us nd Hyge a, u the g d f nu l (F m th
ma ble tatue the L ir)

of nations come naturally to a communion of minds would seem to follow more or less as a matter of course. Health is something about which all nations and people are in accord. No one is opposed to it. Therefore the potentialities inherent in the matter of health as a common meeting ground for the nations of the world and as a catalyzer for world peace come to the fore. For untold

centuries the forces of mankind have failed to bring peace to the world. The lawmaking agents and agencies of nations have failed and religion, from which much more might have been expected in this regard, has certainly failed dismally. In fact, religion has played a provocative role in a great deal of the mortal conflict that has gone on in the world and particularly right here in the continent of Europe and in the Middle East.

And so one is left with a wonderment if the forces of Aesculapius, the forces of medicine, of whose far reaching and potent effectiveness there seems little question, should not be utilized to a greater extent. Acceptance of the doctrine that the language of the good Samaritan is a universal language would appear to be virtually inescapable. Therefore, does it not follow as a natural contention that this doctrine not only be given an unrestricted chance but be promoted as a dominant factor in the world wide dissemination of good will. That it is possible to engender more good will abroad through the medium of a box of pills in the hands of the right kind of physician or a scalpel in the hands of the right kind of surgeon than would be possible by all of the hydrogen bombs and other instruments of annihilation put together, will be argued by few, if any. No group of medical agents is better qualified or more advantageously situated to perform this type of mission than the medical members of the military services. Such practices on the part of medical department personnel of the armed services as well as by medical missionaries, have already engendered and are continuing to engender a great deal of good will throughout the world. However, how long the good will so inculcated or the esteem so occasioned will endure are in a large measure dependent upon how wisely and well our diplomats follow through and carry on.

WORLD PEACE THROUGH WORLD HEALTH

I am sure that medicine alone could never accomplish single handedly in this regard anything like what it could accomplish in conjunction with educators, lawyers, diplomats, engineers, and ministers and I wonder if there is as close collaboration as there might be between the members of the various professions and callings in the furtherance of this idea. I can visualize more significant and more substantial progress being made toward world peace by the co-ordinated efforts of these several agents or agencies as a team than has ever been realized by past independent and unrelated practices. As fantastically amazing as has been scientific progress during the first half of the twentieth century it is entirely conceivable to me that with the advent of atomic power and the potentialities to which it is the key, were the scientists of the world to devote all of their time, energies and intellects to constructive pursuits the second half of the

twentieth century might witness developments and progress that would leave the accomplishments of the first half looking puny by comparison

But to return to a further consideration of certain facets bearing more directly upon my subject I would remind my listeners that the concept of preventive medicine as developed in the armed services is due in a significant measure to the triumphs achieved over many indigenous communicable diseases. These triumphs were achieved by the employment of a wide variety of measures and methods including not only better personal and environmental hygiene but protection by vaccination against a formidable assortment of contagious diseases many of high virulence and lethal potentiality. Another circumstance from which the concept of preventive medicine as developed in the armed services stems has been the widely expanded commitments that have brought service personnel into contact with all manner of diseases prevalent in foreign lands.

NEW GOALS

Important new goals come to the fore. It is not enough to strive to equal the spectacular progress of the past by traveling along similar lines and seeking as we may an ever closer approximation to perfection. To live in health in the world of tomorrow we must set our sights on new and radically different horizons. The new concept abandons the restricted objectives of health measures applied only within our own boundaries and extends them to meet the needs of the family of nations now working in league with the United States. In the past if the British Navy were healthy and strong peace in the British Empire could be realized and if America's armed forces and its people were healthy and strong peace in our land was assured. It will be a different story in the world of the future where objectives will be achieved by nations working in concert. Weakening of any member of the family of nations by shortcomings in the principles of health will weaken the structure of the whole family that seeks to live in a world at peace. Procedures for meeting preventive medicine problems within the confines of our own nation per se will not suffice in an era of international endeavor whether that endeavor be slanted toward peace or war.

Aside from and beyond the principles involved in better public health epidemiological or preventive medical measures a lower ed mortality rate and a longer life expectancy have been and are being contributed to by better therapeutic principles and practices. Certainly the advent of the antibiotics has been of tremendous value in this regard. I use the term value somewhat advisedly however because it is my conviction that in many

instances the use of antibiotics has bordered closely upon malpractice I refer to the indiscriminate use of these agents for the treatment of traditionally trivial conditions, thereby sensitizing the individual to such extent as to contraindicate a future use of these medicaments under circumstances of an urgent, some times vitally urgent, nature

While it may appear somewhat paradoxical to my theme, I would like to cite at this point what I believe to be a fundamental factor in the unrest or inordinate attitude that appears to obtain particularly among the younger element of doctors in America today. I am not aware of how the situation in Europe compares with that in America insofar as the incidence of acute medical and surgical conditions is concerned—I suspect the conditions on this side of the Atlantic and our side are quite closely parallel. Anyway, in America, with the advent of the antibiotics and many other improvements in the management of diseases to which the human being has been prone, there has been such an amazing reduction, and indeed disappearance, of so many of the conditions that formerly and for so long constituted great challenges to the profession of medicine that now the physician finds himself all dressed up with no place to go so to speak. It is difficult for the younger physician to become reconciled to the concept that he also serves who only waits and watches, or for the young board certified surgeon to realize that far greater, although perhaps less glamorous, is the contribution to the welfare of mankind of the epidemiologist or preventive medicine specialist who is engaged in the business of preventing people from becoming ill in terms of thousands, while he the surgeon, is engaged in the more glamorous and exciting specialty of either saving or losing lives one by one. This circumstance to which I have just referred is, I am sure, a contributing factor to the antipathy for service with the military that has been for the greater part of the past decade, so evident in America at least.

HEALTH AND ENVIRONMENT

Now just as there are two sides to more things than a coin there are two sides to this story of better health I made earlier reference to man's struggle to adapt himself to his physical environment. The other side of this story concerns itself with the fitting of the environment to the man, and by this I do not mean to limit the account taken to matters of health per se but to the matter of dietary productivity—the provision of food for man's sustenance. For what profit is there in improving the health and increasing the average life expectancy of a race of people without taking account of the necessity for the provision of adequate sustenance? A political economist by the name of T. R. Malthus who lived between the years 1766 and 1834, point-

ed out the implications upon this score and I think most of us are familiar with the Malthusian theory. There is more than one interpretation to the asseveration that the measure of the world is man. Since the profession of medicine is to a greater extent than any other profession responsible for people living longer and therefore increasing the consumer component is a major responsibility for rendering more of the earth's surface habitable and productive through an improvement of health standards by a similar token not a responsibility of the medical profession? If this is a valid concept and it would appear to be it devolves upon the disciples of the profession of medicine to concern themselves not only with life per se but with bread the staff of life as well. By pursuing this policy we as doctors will be instrumental in the creation of a man environment combination physically and industrially strong enough to produce as well as simply to consume.

And so there becomes apparent the logic inherent in the doctrine first that as a national resource health is second in importance to no other second that the physical and psychological health of the people of our several nations will in its many aspects be the measure of our world power and leadership third that it is incumbent upon physicians the world over to collaborate with the political leader the sociologist the economist the educator the clergy in order that individual and united effort toward economic sociological physical mental and spiritual health among all of our people may be evoked. With such approach the words of Shelley could become a reality

And since dawn the ghate upon the earth
Peace cheer the mind health renovates the frame
Disease and pleasure cease to mingle here
Reason and passion cease to combat where
Mind unfettered over the earth extends
Its all-seducing engines and wilds
The empire of a vast dominion there

MEDICAL PLANNING FOR CIVIL DEFENSE

At a turning point in history when the world seems to rotate around the threatened use of weapons of mass destruction and biological and chemical warfare agents there is a well-known lack of adequate planning for the emergency care of potential civilian casualties. The number of casualties resulting from an atomic attack will stagger the imagination when compared with the casualty figures of previous wars.

—CARLISLE S. LENTZ, M.D.

H p i l

p 65 Ap 1954

PLASMA EXPANDERS IN THE ARMED SERVICES OF THE UNITED STATES

LUTHER C. BELL Captain (MC) USN

ABOUT 4,000,000 units¹ of whole blood are being used annually by our civilian population. Military estimates² for shock solutions are as high as one pint per year for each person in the armed services. The Federal Civil Defense Administration has set a stockpile goal of 7,500,000 units of plasma expanders for civilian³ use.

Rhoads⁴ estimated that 100,000 units of blood or plasma would be needed for casualties caused by one Hiroshima type bomb dropped on Philadelphia. His figures, though only estimates, show the need for a suitable plasma volume expander. National interest in plasma expanders stems from the loss of blood due to war and the chance of atomic attack on our civilian population.

Plasma expanders were used in World War I and to a greater extent in World War II. In 1941 the Blood Substitute Committee of the National Research Council set up standards for a satisfactory plasma expander. Their criteria were (1) maintenance of a satisfactory colloidal osmotic pressure within the circulatory system, (2) constant molecular composition, (3) suitable viscosity, (4) stable within a wide range of temperature change, (5) stable in storage for long periods of time, (6) easily sterilized, (7) nonpyrogenic, (8) nonantigenic, (9) nontoxic to early or delayed, and (10) inexpensive and reproducible in quantities for stockpiling.

Various substances in five general groups have been used as plasma expanders. Some of these are being evaluated⁵ and others have already been evaluated. With such a record it is safe to predict that further research will uncover new and even better substances as plasma expanders. Some of the substances investigated approach the standards set by the committee. Their present status is outlined in Table I. Gelatin and polyvinylpyrrolidone (PVP) meet the standards and will be discussed in this article.

DEXTRAN

Dextran is a macromolecular product of the action of a nonpathogenic

From U S N I Hospital San Diego Calif

TABLE I

Typ	fpl m p d	Pt m p d	St ru
Hum b l d d		Th l pl m	
		S um lbun	H gh c t and h pply
		M d f d gl bun	U rta blood p r p
		H m gl b n l r	Kidn y dam g
		G l t (cl ally ff t)	
Pl m b e t t		I gl (h h yoc II)	H gh c t t i f r h g l
		C d g t	I t gatu n compl t
		A ctu fl d	Imp ual r e f g
		A	Ant g po bly h mfl t g th
		P t	E c g qu buff g b f
		D t	
		P lygl s	Pe bl d p p

TABLE 1—Continued

Plasma expanders	Status
Uthyl cellulose	Excessive tissue storage produces kidney damage
polyvinylpyrrolidone (PVP)	
polyvinylpyrrolidone	Short blood pressure response
polyvinylpyrrolidone	Short blood pressure response
polyvinylpyrrolidone	Short blood pressure response

polyvinylpyrrolidone (PVP) is used in the National Research Council and U.S. Armed Service.

bacterium *Leuconostoc mesenteroides* on sugar slime Gronwall and Ingelman Swedish researchers developed and used dextran clinically in 1944 Since then many British and American researchers have studied the properties of dextran and reported on its clinical use

During the Korean campaign homologous serum hepatitis developed in a high percentage of the wounded given plasma As a result the Surgeon General of the Army directed that dextran replace plasma for operational use and stockpiling Its use has likewise been extended to the medical departments of the Navy and the Air Force All military hospitals have or can obtain dextran for clinical use Other medical units not having whole blood available rely on dextran to combat traumatic shock

Dextran has been used by the armed services in hemorrhagic traumatic and neurogenic shock as operative support and to extend blood ⁷ Results have been good with a minimal reaction rate It has been my experience as well as that of others that in hemorrhagic shock where blood volume loss is from 20 to 30 percent dextran works well Whole blood may be spared if hemorrhage has been controlled

Amspacher and Curreri in 195⁹ reported using dextran in about 60 Korean battle casualties with satisfactory results They believed that patients with mild to moderate blood loss can be treated with dextran alone Severe blood loss required dextran plus whole blood They reported that many of these patients could be maintained in first-aid stations and transported to the hospital before receiving blood This is a valuable adjunct in the treatment of the wounded It should save many lives because it is more practical logistically to keep dextran at the front than blood

The Army Surgical Research Team in Korea has subsequently given dextran to about 1 000 battle casualties with satisfactory clinical results This substantiates the results of Amspacher and Curreri Our hospital ships in Korea used dextran less than our ground forces Blood was usually readily available on the ships and undoubtedly due consideration was not given to dextran as a blood extender

There seem to be no serious toxic effects from the administration of dextran About 60 to 70 percent is excreted by the kidney ¹⁰ percent in the expired air and two percent via the intestinal tract What remains is probably metabolized Anaphylactoid reactions when they occur are usually not severe and are less frequent in the anesthetized than in the nonanesthetized patient

*Preliminary reports from the Army Medical Service Graduate School, Washington, D C indicate that dextran in certain amounts does measurably prolong bleeding time in a significant percentage of people receiving it. This is preliminary work and will be reported on subsequently in greater detail. It is suggested though, that those having occasion to use this material be observant as to the possible occurrence of an excessive bleeding tendency occurring six to 18 hours following infusion with 1 000 cc or more of the material."

Rhoads discussed two cases of postoperative hemorrhage in patients who received dextran and suggested the agent might be the contributing cause. It should not be given subcutaneously or intra arterially. Neither should it be given to patients with severe cardiac conditions, nor to those with lower nephron nephrosis or severe kidney damage.

Ede¹ tells of a patient who received dextran in the radial artery at the wrist. The patient was exsanguinating from a femoral laceration when cardiac arrest occurred. Dextran was given intra arterially before blood could be obtained. The following day the forearm was black and blue and later became gangrenous requiring amputation. The catastrophe was presumably due to replacement of blood in the forearm by the viscid dextran, resulting in thrombosis of the vessel and death of the part before circulation could be restored.

Dextran has been used with increasing frequency at this hospital. One hundred and seventy two units have been given to about 100 patients. Ninety five percent was given for hemorrhagic and traumatic shock. The remainder was used to extend blood, or given to patients who failed to respond when given what seemed adequate blood. Ninety two percent of patients receiving dextran also received blood.

In general results have been good with no bad clinical effects. Dramatic results were noted in two patients suffering from shock, one with bile peritonitis and one with intestinal obstruction that had not responded to blood. Another patient during disarticulation of his hip, had a transfusion reaction and went into shock. The blood was discontinued and dextran given. Blood pressure returned and the operation progressed without further trouble. A fourth patient following total pancreatectomy, suffered prolonged shock. This patient was not given dextran; he may well have responded to it had it been given.

Craig and associates¹³ have pointed out how expanders are used at the Mayo Clinic in patients undergoing sympathectomy for hypertension. After operation blood pressure was maintained better and the second stage operation could be done earlier than

Tissue changes allied to PVP retention are being studied by the Pathology Committee of the National Research Council. Time and material have not permitted conclusions relative thereto.

PVP has not been used clinically by the medical departments of the Armed Forces so far as I have been able to ascertain; however, the material has been approved for stockpiling by the Council for the Department of Defense and the Federal Civil Defense Administration for emergency use only.

USE OF PLASTIC BAG FOR PLASMA EXPANDERS

The plastic bag has been developed and is being studied for the administration of plasma expanders in the armed services. Evaporation of the material from the bag has been overcome through the use of aluminum foil. The bag is a practical idea because shipping weight has been reduced by one pound per a 500 cc unit of dextran. Shipping and storage space is less. Another advantage is that a unit can be carried by a first aid man into the front line of battle. Compression of the bag at the time of administration expedites the flow of the expander into the patient and prevents the possible hazard of air embolism. The bag can also be used for dispensing blood for which it has advantages similar to those mentioned above.

SUMMARY AND CONCLUSIONS

The use of plasma volume expanders should be encouraged in military and civilian hospitals. They extend blood combat shock prophylactically and treat hemorrhagic shock with mild to moderate blood loss.

Dextran has been approved for use as a plasma volume expander by the armed services of the United States. It may replace plasma entirely unless the danger of homologous serum jaundice can be controlled.

The gelatins have been used by the armed services to a limited degree. Although effective, they fail to meet all of the requirements for stability, shipping, and front line needs.

PVP is likewise an efficient expander but has the disadvantage of tissue storage, the ultimate significance of which is not clearly understood. It should be used for emergencies only.

Judging from my experience, patients who do not respond to adequate amounts of whole blood should be given one of the approved expanders unless there are contrary reasons.

Expanders are not blood substitutes. Their use should in no way influence our national blood program.

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Of the casual vices which I wish to discuss briefly in relation to old age perhaps alcohol is the most important. It is generally agreed that although alcohol is not contraindicated in the aged the tolerance for it diminishes in the later decades of life. Chen has shown experimentally that the average lethal dose of alcohol as determined in a large number of mice is inversely proportional to their age. What's bad for old mice must be bad for old men!

—RUSSELL L. CECIL, M.D.

in *Journal of American Geriatrics Society*
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ADJUSTMENT TO THE ARMY

The Soldier's Identification With the Group

EARLE SILBER *First Lieutenant, MC USAR*

A PSYCHIATRIST for a mental hygiene consultation service in an army training center has an unusual opportunity for the study of persons who have difficulty in adjusting to a new social and environmental setting. The training center to which I was assigned received men entering the army from civilian life who were assigned for basic training in the Army Medical Service. Because of the location of the consultation service at the center within the training area, there was opportunity to learn about soldiers who were referred as problems and also those who were able to make a satisfactory adjustment without benefit of psychiatric consultation. Serving as medical officer during sick call provided among other things additional opportunity for understanding the problems some soldiers have in a training camp.

In reviewing my experiences as a military psychiatrist, I have been struck repeatedly with the importance of observing the soldier's attitudes toward his group and his interaction with the group in order to understand more fully his capacity to adjust to military life. In this article I have attempted to present a summary of this problem. It was written to emphasize an important area of needed research: understanding the process of group identification as a sustaining factor in human behavior.

PRESENCE OF SYMPTOMS VERSUS ABILITY TO FUNCTION

It has been a common observation that success or failure in adjustment to military life in a practical sense has no constant relationship to the presence of manifest psychiatric disorder. Studies of many persons repeatedly demonstrate the fallacy of equating failure in the military setting with the presence of psychiatric symptoms. Many soldiers appear to be able to adjust in spite of either physical or emotional limitations while others with seemingly minor disabilities appear to be incapable of making a satisfactory adjustment.

It is important that in estimating the severity of a person's emotional disturbance, one make an assessment of the total

personality and its resources along with its areas of disturbance. In the military setting it is obvious that emotional disturbance need not prove to be incapacitating in terms of the soldier's ability to function and perform his duties successfully. This was illustrated by re-evaluation examinations in which unit commanders were requested to refer to the clinic soldiers who had a manifest psychiatric disorder at the time of induction (designated by an S-3 profile¹ in their records) but who appeared to be functioning adequately after from eight to 10 weeks of training. This involved almost every trainee so designated and in almost every instance these men had, in a practical sense, been functioning well in spite of the presence of recognizable symptoms. They had not lost time from training, had not been on sick call for their symptoms, had not come to the attention of the training center psychiatrist, and had been able to participate in aspects of training usually considered most anxiety-laden, such as participation in weapons and bayonet training, the infiltration course, close combat course, et cetera. Many soldiers in this group demonstrated their attitude of wanting to do their best in spite of certain symptoms, minimizing the significance of the symptoms, and wanting to remain with the group. As an interesting corollary, many soldiers who presented serious problems in the training center, had no notation in their record of manifest psychiatric disorder at the time of induction. It is recognized that these observations were not made as a result of any over-all statistical study, but nonetheless were believed to be so repetitive and striking as to be noteworthy.

The severity of a psychiatric illness is a relative concept, it represents a degree of maladaptation to a particular environment at a particular time. Under certain situations, psychiatric disorders may only exist in covert form because of the compensating interaction between the environment and the person while under other circumstances it becomes crippling because of the stresses and anxiety provoking disharmony between the environment and the person. Similarly, the degree of maladjustment resulting from physical disability cannot be understood unless one is aware of the interaction between the person with the disability and the social group.² The severity of a disability or potential disability cannot be understood unless one examines the problem from the point of view of the interaction of the total personality and the social setting and not just in terms of symptoms per se.

It is understandable, therefore, that examining a person in one setting may reveal him to be relatively free from disabling anxiety and give a false picture of his ability to adjust to a different setting. For example, there is generally much greater freedom for persons to act out problems in a civilian setting, provided that such behavior is accepted and does not meet with reprobation.

cussions on the part of the environment. This is seen repeatedly in the life history of the very immature person whose infantile behavior and excessive dependency are actively fostered by significant figures in his family life or in the life patterning of the generally inadequate person who lives in a social situation where little demands are made on him

THE UNIQUE DEMANDS OF THE MILITARY GROUP ON THE SOLDIER

One aspect of understanding these problems involves a clearer understanding of the uniqueness of the social setting in military life. It is important to know what is demanded of the soldier in making a successful adjustment to military life that differs from his adjustment in a civilian setting. Some of the more obvious facets of military life to which adjustments must be made by the new trainee are: separation from significant figures in his personal life; interruption of previous patterns of sexual behavior; training in various aspects of aggressive warfare; lack of privacy involved in living in a barracks in close relationship with other men; absence of direct control in planning the course of his army career; loss of previous status; adopting new codes of social customs peculiar to the military; and living in a generally controlled authoritarian atmosphere.

Attitudes on the part of the group concerning particular types of behavior play an important role in determining success or failure in adaptation of some persons in this new social setting. As an illustration of this, compulsive promiscuity may in a clinical sense be an indication of underlying anxiety, but yet a person in a military setting whose problems are manifest in this particular way will probably find a high degree of social acceptance among many of his peers. More remains to be learned of the culture of the army and its standards of normalcy from the point of view of social acceptability.

There are considerable variations in concepts of a good soldier among military personnel in general. Group leaders influence the attitude of the group toward soldiers who manifest certain types of behavior problems or psychiatric symptoms of one type or another. The display of certain types of symptoms by trainees provokes varying types of responses (anxiety, hostility, sympathy, et cetera) among leaders who may be in a position to determine whether or not certain soldiers become failures in adjusting to the military. Among such psychiatrists in the services, irrational motives may influence their treatment and disposition of some soldiers as prematurely recommending their separation from the service because of the psychiatrist's own feeling of insecurity. The personality of the soldier himself cannot be separated from his interaction with others whose response to his

behavior may be instrumental in determining whether or not he will fail in adjusting to a certain situation. This aspect of the problem concerns attitudes stemming from the social group and being directed toward the person, and define to some extent the social situation in which the person must make his adjustment.

ATTITUDES OF THE SOLDIER TOWARD THE MILITARY GROUP

The second aspect of this problem concerns attitudes generated in the soldier and directed toward the group, or what attitudes flow from a person to the social group. It is my belief that investigation along these lines will point to answers of the question one is forced to ask repeatedly: *e*, what is it that enables certain persons to function with symptoms of emotional or physical disability while others with seemingly trivial or minor disturbances are completely unable to function or function ineffectively?

The importance of "good motivation" as a factor enabling certain soldiers to function in spite of the presence of minor defects in military life is evident to those working in the field of military psychiatry. Because there are many obvious factors which influence motivation at a conscious level, all too often some of the unconscious determinants tend to be overlooked. One of the many ways of attempting to determine the cause of poor motivation is from the point of view of the soldier's attitudes relative to identification with the group. Poor motivation is only symptomatic of a disturbance in the interrelationship between the person and his social environment, and one must go beyond the surface manifestations of the motivational problem in order to ferret out what it really indicates. To the person concerned, his attitude may be completely justifiable and yet is symptomatic of maladjustment from the point of view of the total social situation. Indeed the symptom "poor motivation" in whatever way it is expressed (*e g* the chronic sick book rider," the AWOL offender the gold brick") is as anxiety determined as other symptoms of maladjustment but, unlike the neurotic symptom represents a conflict between the ego of the person and the environment in which he is operating. It is believed that this question of motivation is correlated with certain attitudes or absence of attitudes on the part of the person toward the military group as a whole. Many people, in spite of various types of psychiatric disorders, are able to make a satisfactory adjustment to army life provided their problems do not infringe to a large extent on their need for group acceptance and their ability to accept the goals and aims of the group as their own.

More attention must be focused on understanding the way the army as a social group is symbolized and perceived by soldiers who manifest various types of character disorders. At the training

center the character disorder group constitutes the greatest percentage of men referred for psychiatric consultation with problems not only to themselves but to the group itself. Where the personality organization is such that there are strong needs for social acceptance and approval albeit neurotic or anxiety driven in nature persons may continue to perform effective service in the face of serious emotional problems.

One line of investigation might deal with the symbolic meaning of the army* and how this is perceived by different personality types. For example some soldiers may be able to use the army and the symbolic implications of being a member of this social group as a supportive adaptive mechanism in the resolution of their own internal problems. Some men find that participating and sharing in a large powerful organization offers a defense against anxieties stemming from feelings of isolation and may gratify unresolved needs for contact with the powerful benign and protective parent figure.

A very frequent mechanism of adaptation involves the phenomenon of identification with the aggressor described by Anna Freud. Many persons fearful of authority figures resolve this problem by incorporation in their own personalities characteristics of the feared person in their environment. Through this process persons may identify with attributes of authority figures symbolizing strength and masculinity and in this way increase their own internal feelings of security. This process is frequently seen in persons who become as tough in their interpersonal relations as their superiors and ward off anxieties related to them in this way. Bettelheim described prisoners identifying themselves with the aggressive behavior of their guards as a mechanism of adaptation in extreme situations. Although not applicable in a real sense this same type of situation exists in a psychological sense in terms of the way the relationship of the trainee to his superiors is often perceived by the trainee.

On the other hand this identification may be perceived as being dangerous and anxiety laden. This was most clearly illustrated by a small group of conscientious objectors I saw in consultation and who presented an extreme point-of-view of categorically refusing to train even as noncombatant soldiers. It was apparent in studying them that there was a compulsive need to reject any identification with any aspect of the army because the army for them symbolized that which they found necessary to reject in themselves and because the very process of identification with this group placed them in a role which for them was anxiety provoking. With this group the army is perceived as the ultimate symbol of violence and destruction and their character or ego-organization is such that any awareness of

such feelings becomes a signal of anxiety. Obviously they generally have a passive orientation in their relationships to others. They represent an interesting group because they manifest problems in identification with the army as a social group at the far end of the spectrum and they are incapable of rendering any effective service whatsoever.

Persons with marked antisocial personalities also illustrate this problem in group identification and reflect in their attitudes to the authoritarian aspects of the army early disturbances in the process of identification with parents and their later counterparts in social groups. Immature, passive dependent men experience considerable anxiety in the military setting when suddenly required to identify themselves with a masculine group thus accentuating their own problems of masculine identification. They frequently present serious problems in a training center and may be more maladjusted in this type of social setting than those who are frequently thought of as being more sick in a clinical sense. As would be expected they also experience difficulty in identifying themselves with an aggressive group and aspects of training which symbolize and involve stimulation of aggressive feelings. This may be applied also to the schizoid, withdrawn group where there is little manifestation of social hunger and need for acceptance by the group. Here the problem may be thought of as one in which early repeated trauma and rejection result in a personality organization in which closeness to others in a group situation and need for belonging become signals of anxiety.

Failure in adaptation may also occur if the soldier is assigned to a particular branch of the service which presents special problems in identification. This frequently was observed in a medical replacement training center where a "medic" was sometimes regarded in a feminine passive role where maladjustment occurred because of great need for hypermasculine identification.

It is not to be implied that the presence of moderate degrees of character disorder inexorably results in failure in adaptation in the training situation. On the contrary, the problems of many soldiers may be resolved in such a way as to be useful not only to them but also to the group itself. Perhaps the supportive sustaining forces which may be operative have not been stressed sufficiently in our attempt to understand problems of this type. What should be emphasized is the importance of the group situation as one of the vital sustaining forces in military life. It is postulated that a common mechanism by which failure in adaptation occurs involves an inability of certain soldiers to make use of this sustaining force and that the lack of such ability distinguishes to a large degree those who fail in making a successful adjustment in the military setting.

IMPLICATIONS

It has been increasingly obvious that greater skills are required in being able to predict whether or not a person will be capable of making a successful adjustment to military life and more objective tools are needed than the psychiatrist has available now. It appears wise to adopt a more functional and empirical point of view and to screen at the induction center only those persons who manifest overt grossly disabling failures at adaptation. It has been observed that no matter how many potential failures are eliminated at the induction center roughly the same numbers of persons break down and require separation shortly after their induction. The best point at which to evaluate the capacities for adjustment appears to be after the person is actually in the military situation after a trial period of duty. Even then more validated techniques are needed for making sound more accurate predictions as to adaptability.

Focusing attention on the problems of adjustment to the group and the problems of identification with the group has aided in the disposition of such soldiers. It is believed that such an approach is more realistic and pertinent to the over all problem. Greater emphasis should be placed on how the patient's symptoms are incorporated in the personality and on his over all adjustment to the group. It was important to focus any therapeutic endeavors on the current immediate situation and to attempt to mobilize as much as possible the person's own resources. Group therapy was especially effective in the training situation both as a diagnostic and therapeutic medium. It is believed that one reason for its effectiveness was its value in facilitating group relationships in the therapy situation and subsequently in the particular unit to which the soldier was assigned.

The importance of understanding group and social mechanisms in the management of psychiatric casualties in combat is now an established principle in military psychiatry. It is beyond the scope of this report to discuss combat psychiatry but it is believed that there are certain implications of the experiences in this area which are pertinent. Discussing psychiatric treatment in combat areas Ranson* stated

It was found to be of primary therapeutic importance to avoid breaking the patient's identification with his combat group. To this end hospitalization was maintained within the division or in close proximity to it. Emphasis was placed on impending return to combat duty. Maintenance of identification with the combat group was facilitated by keeping the length of hospitalization short by the attitude of the psychiatrist and by visits or entertainment and educational measures. Army psychiatric centers carried on a therapeutic program of so called inpatient and outpa-

tion" designed to promote continued interest in the war motivation to fight and identification with the interests of the combat group

Others have also pointed out the importance of the soldier's ability to integrate himself within the group as a determinant of his resistance to the trauma of combat.¹¹

The most important implications of this approach point in the direction of further research in understanding the significance of group mechanisms as an important factor in human behavior. The Army mental hygiene consultation services offer an excellent setting for the study of problems as outlined in this article. A military situation can be used as a setting in which experimental hypotheses concerning adaptive behavior can be tested. Attempts to improve the criteria of predictability of success in military life can serve as a testing method for varying theoretical presumptions which are made about human behavior. Its value goes far beyond its immediate practical implications. There is much to be learned about the hidden positive resources of the human personality. The greatest application may lie in the area of preventive psychiatry by attempting to learn more of how group identification may be facilitated and therefore serve as one of the sustaining factors in preventing failures in adaptation.

SUMMARY

This communication has not intended to encompass an exhaustive survey in regard to problems in military adjustment but has focused on one area—certain problems in group identification and its relationship to understanding successful and unsuccessful adaptive mechanisms as they occur in the military setting. The hypothesis is offered that one of the broad common denominators in successful adjustment to military life depends on a soldier's ability to identify himself successfully with the army in whatever way it is symbolically perceived. Similarly, in a soldier's failure in adaptation to military life, one of the broad common denominators involves a disturbance in identification with the army in a particular manner which is disruptive and socially disuseful. A common mechanism by which failure in adaptation occurs involves an inability of certain persons to make use of group identification as a sustaining force in military life. Certain implications in regard to therapy in a military setting, problems in selection of personnel, combat psychiatry, the need for research, and the preventive aspects of this type of approach are pointed out. Emphasis is made in stressing group identification as a sustaining force in the military setting and in the need for studying positive adaptive processes in human behavior.

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It should be remembered that it is helpful to the bibliographer to know in detail the purpose for which a bibliography is to be used.

The Library does not provide translating or abstracting services but searches will be made for abstracts or translations already appearing in the literature when this is desired. Names of private abstracters and translators, who charge fees which must be paid by the person ordering the service, can be supplied on request.

Publications. The Library also issues a number of publications, the most important of which are:

1 *Current List of Medical Literature.* This is a monthly publication which lists the tables of contents of about 1,100 selected medical journals currently received. A subject and author index is included with each issue and a semiannual cumulation of the indexes is also furnished. The *Current List* is distributed free on request to installations within the military establishment. Individuals may purchase subscriptions through the Superintendent of Documents, Government Printing Office, Washington 25, D. C. at \$13.00 a year (\$17.00 for foreign subscriptions).

2 *Armed Forces Medical Library Catalog.* This is an annual publication containing the record of books and journals catalogued during the year in two sections, author and subject. The Library deposits copies in certain major military medical installations. Additional copies are available from the Card Division, Library of Congress, Washington 25, D. C., at \$17.50.

3 *Index Catalogue of the Library of the Surgeon General's Office.* This has been a publication of the Armed Forces Medical Library since 1880. The last volume to appear is volume 8 of the fourth series in 1948. Volume 9 is soon to be published, and will be the last regular volume, although supplementary series closing out the work of the predecessor will be published over the period of the next calendar. Copies of the *Index Catalogue* are deposited in all major military medical installations and in

many other libraries and research institutions throughout the world

4 *Occasional bibliographies* of a comprehensive nature on subjects of current interest are published and distributed free on request to the Library. The most important recent titles are

The Pituitary Adrenocortical Function ACTH Cortisone and Related Compounds 1950 3 431 citations

Plasma Substitutes Except Those Derived From Human Blood 1940-1951 An annotated bibliography 1951 886 references

Bibliography of Military Psychiatry 1947-1952 Literature Relating to U S Armed Forces With Selected References Relating to British Forces 1953 545 references

Gas Gangrene and Gas Gangrene Organisms 1940-1952 An annotated bibliography of the Russian Literature 1940-1952 and the Non Russian Literature for 1953 1953 324 references

Bibliography of Military Medicine Relating to the Korean Conflict 1950-1953 1953 110 references

A comprehensive bibliography on the subject of bone physiology is scheduled for publication in the late fall of 1954

5 The Armed Forces Medical Library *News* a brief monthly review of the professional activities of the Library which is of particular interest to other medical librarians. The cost of printing the *News* is borne by the Friends of the Armed Forces Medical Library a voluntary organization founded in 1953 following the dissolution of the Honorary Consultants to the Army Medical Library

INFECTIOUS MONONUCLEOSIS

The etiology of infectious mononucleosis is still not established. Although it is generally regarded as a specific viral infection there is no convincing evidence that this is the case. Many of the clinical and laboratory features suggest that it may be a disease of hypersensitivity but this concept of its pathogenesis does not rest upon positive evidence. The reported occurrence of epidemics of the disease is evidence against such a concept. The possible role of an allergic reaction to bacterial infection deserves more attention.

—JOHN S. HUNT, M.D.

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Toxic Organic Psychoses Due to Isoniazid Therapy

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WITH the use of isoniazid therapy for pulmonary tuberculosis, observations both in animals and humans have revealed signs of toxicity in the central and peripheral nervous systems. The reported cases to date, however, reveal evidences of a toxic psychosis in only a few patients in whom larger than usual doses of isoniazid were used.

Hunter reported a case of acute toxic confusional psychosis in a patient who eight weeks later showed residual organic cerebral impairment of the Korsakoff type. His patient had received from 3.5 to 5 mg of isoniazid per kilogram of body weight for three months and then the dosage was doubled for an additional month before she developed obvious toxic psychotic symptoms. This case was also somewhat complicated by the fact that the patient, emaciated and extremely ill with tuberculosis, had developed a microcytic hypochromic anemia. Eight weeks after therapy was discontinued she still showed evidence of organic cerebral impairment clinically and by psychometric testing. Chu² reported one case of a toxic psychosis manifested by the usual signs of confusion plus delusions of persecution, ataxic gait and slight tremor of the hands, following prolonged ingestion of from 700 to 950 mg of isoniazid daily (from 10 to 14 mg per kilogram of body weight). The psychosis apparently cleared three days after the drug was discontinued. After using isoniazid in 51 mentally ill patients with active tuberculosis, however, Krieser and associates³ reported an opposite effect. Treatment with the drug resulted in an improvement in the mental behavior of psychotic patients; those with functional psychoses showed about 50 percent improvement.

The Committee on Therapy of the American Trudeau Society reported that although toxic reactions occur they are relatively minor in comparison with those due to streptomycin, dihydrostreptomycin, amithiozone and viomycin. The Committee reported that various toxic reactions occur in about five percent of the patients receiving the drug but in only one percent is the toxic reaction severe enough to contraindicate further treatment with

isoniazid The average daily dose of from 150 to 300 mg or even up to 600 mg daily was considered to cause no increase in the frequency of toxic reactions The nervous system was most frequently involved the commonest reactions being twitching of muscles restlessness and hyperreflexia Other minor reactions were nervousness apprehension insomnia and headache More serious reactions were vertigo syncope convulsions peripheral neuritis major psychosis and difficulty in micturition Allergic reactions and gastrointestinal genitourinary and hematopoietic system disturbances may also be sites of toxic manifestations In 101 patients treated with isoniazid Robitzek and associates reported the occurrence especially in older patients of vertigo muscle twitching hyperreflexia delay in micturition mild euphoria and headache In 65 patients treated with isoniazid similar side effects of lesser severity were reported however no cases of major psychosis were noted Benson and associates reported the toxic manifestations of these drugs including central nervous system manifestations of apprehension and convulsions and death due to respiratory failure in mice rats rabbits and dogs Significant toxic effects were noted only when the drug was administered in amounts considerably greater than the therapeutic dose These experiments also revealed that these agents were administered intrathecally in rabbits and dogs without them developing neurologic signs which would indicate that these drugs do not have direct effect on the central nervous system Rubin and associates reported acute toxicity characterized by excitement and convulsions in mice and dogs prolonged administration of the drug to dogs resulted in ataxia and tonic and clonic convulsions They also concluded that the effects were reversible on the prompt withdrawal of the drug

The following two patients were observed at about the same time at this hospital and under similar conditions Both patients were treated with 300 mg of isoniazid daily and both developed toxic organic psychoses which required their transfer to the neuropsychiatric department of this hospital for treatment Interestingly both patients were young healthy Negroes with minimal tuberculosis A review of the literature revealed that these two patients constitute perhaps the first reported cases of toxic organic psychosis due to isoniazid given in an amount usually considered normal and safe

CASE REPORTS

Case 1 A 26 year old man weighing 165 pounds was first admitted to this hospital on 28 July 1953 for observation for tuberculosis Shortly after his admission many of the features of his past history were recognized as bizarre examination revealed the patient to be obviously psychotic and he was trans

ferred to the closed ward in the neuropsychiatry department. It was subsequently learned that he had been treated for tuberculosis at another hospital for three months and that he had gone AWOL on 7 July 1953 from that hospital. A review of his original history, as well as of information he furnished after his psychosis improved, indicated that he had been hospitalized the latter part of January 1953, and that a sputum culture had been positive for *Mycobacterium tuberculosis* in March 1953. Consequently he had been transferred to an Army treatment center for tuberculosis, where the diagnosis of minimal pulmonary tuberculosis was made and he was placed on intermittent doses of streptomycin and daily doses of 300 mg of isoniazid. Serial roentgenograms showed some clearing of the pulmonary infiltration between April and June 1953.

His past history was not considered too reliable because of his marked tendency to confabulate, however, information from collateral sources indicated a fairly average past with no severe neuropathic traits. A search of his military hospitalization records revealed that prior to the diagnosis of his tuberculosis he had been hospitalized for "headaches and nervousness" associated with excessive alcohol intake and marital difficulties; however, no psychosis was evidenced. It was also known that this patient had recently used alcohol to excess on several occasions. On admission to this hospital examination revealed a rather confused but oriented patient with flattened affect, a tendency to be circumstantial and concrete, and manifesting a great deal of confusion, especially regarding his recent past history. There was a delusional quality to many of his statements and some ideas of reference were expressed. He admitted having had some auditory and visual hallucinations; however, he denied remembering their content. He had moderately hyperactive reflexes but no evidence of any focal neurologic lesion. Cerebrospinal fluid was normal. Psychologic testing revealed evidence of organic impairment without evidence of a purely functional psychosis. Two months later after the patient showed marked psychiatric improvement repeat psychologic testing revealed only minimal residual evidence of his former organic impairment although he still showed a residual amnesia in connection with the events leading up to and during his unauthorized absence from the hospital. Under amobarbital sodium, although amnesia persisted, the patient recalled the circumstances leading up to his going AWOL from the other hospital. At that time, he had experienced symptoms of increasing tenseness, nervousness, headache, and insomnia and was able to describe symptoms comparable to illusions, such as misinterpretation of shadows and normal noises occurring at night on the ward, when insomnia had kept him awake for about 48 hours prior to his unauthorized departure.

His subsequent conduct in this hospital was good as it was in the previous hospital where he was undergoing isoniazid therapy. The patient was then given intermittent doses of streptomycin and daily doses of para aminosalicylic acid which he tolerated without difficulty.

Case 7 A 23 year old man weighing 130 pounds was admitted directly to the neuropsychiatric department on 27 July 1953 with a transfer diagnosis of schizophrenic reaction paranoid type. In March 1953 while stationed in Germany he noted the onset of a dry cough associated with some shortness of breath on exertion. By the latter part of April 1953 he was having night sweats and had lost 12 pounds in weight.

He was found to have a large pleural effusion with fluid level at the anterior end of the right third rib. He was immediately hospitalized and it was subsequently found that his sputum contained acid fast bacilli. On 11 June 1953 he was started on 300 mg of isoniazid daily and intermittent doses of streptomycin. The patient tolerated the drugs well until three days prior to his transfer to this hospital when he became acutely anxious and very fearful that other patients on the ward were going to harm him. Later after being placed in a private room he became acutely disturbed insisting he heard voices outside his door and saw faces outside his window which were going to harm him. He jumped out of his window and started to run away from the frightening voices and faces. He was apprehended and given a sedative but the following morning he again appeared acutely apprehensive and obviously psychotic.

On arrival at this hospital the patient although oriented was extremely apprehensive and readily admitted having many bizarre hallucinatory experiences including a voice which told him he and the nurse were going to be hung in the morning and that attendants were plotting to shoot him. He was agitated and constantly carried a Bible in his hand. He asked the doctor to protect him and keep people from harming him. He interpreted relatively normal ward noises as proof of the fact that people were plotting to kill him. For several days this extreme agitation alternated with periods of excellent contact with reality during which he would readily admit the hallucinatory experiences that he had a few hours before but could not explain them.

A review of this patient's past history revealed that his home environment was stable and he was well adjusted. His employers for whom he had worked for two consecutive years stated that he was extremely well liked and adjusted and that they were anxious for him to return to his former civilian job. The patient denied ever consuming a significant amount of alcohol and this was confirmed by collateral sources.

A lumbar puncture done shortly after admission to this hospital revealed entirely normal spinal fluid pressure and findings. The patient showed no neurologic changes.

On admission to this hospital a toxic psychosis was recognized. All chemotherapeutic agents were discontinued and the patient was maintained only on intermittent minimal sedation. After his acute agitation disappeared, evidences of his toxic psychosis recurred over a period of about three weeks. A group of psychologic tests demonstrated evidences of severe organic impairment, including perseveration, generalized confusion, and severe memory deficit without evidence of functional psychosis. His full scale IQ was 65.

During his six months hospitalization in the neuropsychiatry department, the patient's conduct, behavior and co-operativeness gradually improved. However six months after his last dose of isoniazid he still showed some of the classical residual features of an organic psychosis, such as labile inappropriate affect, impairment in concentration, and a moderate amount of confusion. No improvement occurred in his IQ, serious perceptual errors, signs of regression, disorientation, and perseveration still persist and some signs are mildly indicative of schizophrenia.

With improvement of his toxic psychosis about a month after his admission to this hospital because he still required chemotherapy for his tuberculosis he was treated with intermittent doses of streptomycin and daily doses of para-aminosalicylic acid without evidence of recurrence of his overt psychotic manifestations. Serial roentgenograms of his chest showed a gradual clearing of the pleural exudate. He had no evidence of a parenchymal lesion.

DISCUSSION

Both these patients were treated with 300 mg of isoniazid daily. Symptoms of an organic psychosis developed after three months of therapy in one patient and after seven weeks in the other patient. In the first patient there may be room for minimal doubt regarding the specificity of the organic factor, in spite of his past history of periodic alcoholism, however, a review of his hospitalization at the first hospital where he received streptomycin and isoniazid therapy revealed no evidence of his having obtained and consumed any alcohol. During subsequent observation at this hospital, there was no evidence of alcoholism. This patient clinically recovered from his psychotic episode and no deficit remained other than for his three weeks of amnesia. He still showed a tendency to fill in this anamnestic gap with confabulation. Psychologic retesting, however, reveals minimal evidence of remaining organic impairment which, it will clear

The second patient had no emotional difficulty prior to his illness his psychosis was of the classic toxic variety leaving him with a significant degree of organic cerebral impairment which was evident both clinically and by psychologic testing. The fact that later psychologic test data revealed that he showed some mild schizophrenic features is believed to be of no consequence. It is well known that any organic psychosis including those caused by brain tumors may simulate schizophrenia. It is believed that this does not invalidate the assumption that this man's psychosis and evidence of brain damage were the result of isoniazid therapy. In these patients no other toxic factor was involved. Neither had received any significant amounts of barbiturates. Both were subsequently treated with streptomycin and para-aminosalicylic acid for over four months without any subsequent difficulty. When the isoniazid therapy was discontinued both patients began to improve. The only logical conclusion is that isoniazid was the toxic factor. It is not desirable to expose these patients to further isoniazid therapy in an attempt to reproduce their organic psychosis under controlled conditions because both patients evidenced marked cerebral involvement with residual impairment in one. The danger of impairment to these two susceptible men far outweighs our scientific curiosity.

Over 1 000 patients with tuberculosis have been treated with 300 mg. of isoniazid daily at this hospital for variable periods of time (three months or longer) without a single case of toxic organic psychosis developing. A few of these patients have received up to 450 mg. of isoniazid daily.

SUMMARY AND CONCLUSIONS

Two young relatively healthy Negro soldiers while being treated with isoniazid for tuberculosis developed symptoms of toxic psychosis with subsequent evidence of organic cerebral impairment. One made a good clinical recovery while the other made only a fair clinical recovery with evidence of severe residual cerebral impairment.

Toxic organic psychoses due to isoniazid used in normal therapeutic doses although rare do occur. The danger of permanent cerebral damage exists and significant early signs of cerebral toxicity should be considered an indication for discontinuing isoniazid therapy immediately.

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New Indication for Substitute Urinary Bladder

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THE unsatisfactory long term results of ureterointestinal anastomoses as well as the number of cases in which these anastomoses are impractical have stimulated surgeons to seek ways of forming substitute bladders. One of the first efforts at formation of a substitute urinary bladder was made by Tizzoni and Foggi in 1888. They used a segment of ileum with its blood supply intact, closed one end, and anastomosed the opposite end to the neck of the bladder. They later implanted the ureters into this ileal bladder.

Merricks and associates in 1951 reported four cases in which the ascending colon was used as a bladder and the terminal ileum as a urethra. The ileocecal valve was used as a sphincter mechanism. Continuity of the gastrointestinal tract was established by ileocolostomy. In one case of this type the patient was alive and well 15 years after the operation. Brickner and Eiseman⁷ also reported on this type of substitute bladder. Rieger and Weissner reported on a paraplegic in whom a substitute bladder was formed.

Peck and Newland used the method described by Gilchrist and associates in operating on five patients with infiltrative cancer of the bladder. Two of the patients had inoperable lesions and surgical intervention was performed purely as a palliative measure. Complete relief from bladder spasm, frequency, and burning resulted, however, and a full course of radiation therapy to the pelvis was possible. These patients catheterized themselves every four to six hours. Four months after the operation one of these two patients was lost to follow up and he died later, apparently from recurrence of his carcinoma. There was one operative death.

A new indication for a substitute bladder is presented in the following case:

From Walter Reed Army Hospital, Washington, D. C.

CASE REPORT

A 27-year-old white man received multiple injuries from grenade fragments and small arms fire in North Korea on 26 July 1951. He had fractures of the pubic rim, large bowel perforation, right hemothorax, destruction of about three fourths of the bladder, and lacerations of the right testis, perineum, rectum, and anal sphincter. Details of immediate treatment are not available but the first definitive procedures were instituted at a mobile army surgical hospital unit. Debridement, repair of the bladder and rectum, double barrel sigmoid colostomy, and supportive treatment were given. These procedures were very poorly tolerated and there was considerable bleeding from the bladder.

One week later the patient was evacuated to Japan where additional debridement was carried out. A right orchiectomy was done and a second attempt was made to repair the bladder and rectal defects but, because of hemorrhage, only partial repair could be achieved. The following day, the right inferior vesical artery was ligated because of continued hemorrhage from the bladder. Minor surgical procedures were performed during the next few days and a third and unsuccessful attempt was made to close the bladder and rectal defects. The suprapubic cystostomy was ineffective for urinary drainage because of the vesicorectal fistula. The patient received a total of 39 pints of whole blood during the first two weeks following injury.

In January 1952, the patient was transferred to an army hospital in the zone of the interior where it was noted that he had multiple bladder calculi, right renal calculi, and bilateral pyelonephritis and had lost 30 pounds in weight. He was receiving large doses of morphine in an attempt to relieve the pain of his bladder spasms.

In February 1952, the vesicorectal sinus tract was excised and the defect closed, but this repair was unsuccessful. In May 1952 the vesicorectal fistula was repaired for the fifth time but again without success. Urine escaped from the rectum freely because the rectal sphincter had been destroyed. This, together with the fact that the patient was bedridden, emaciated, incontinent of urine and in continuous discomfort, presented many nursing problems. In August 1952, a calculus lodged in the lower third of the right ureter causing a complete block. A right ureterolithotomy was performed, but several more calculi were noted in the kidney. It was believed that little more could be done for the patient but he requested transfer to Walter Reed Army Hospital for further treatment.

When seen at this hospital in March 1953, he was emaciated and in extreme discomfort due to bladder spasms and continued

leakage of urine from the rectum. A suprapubic cystostomy tube was in place but functioned poorly despite the use of a Stedman pump. The right testis was absent and in addition to a large vesicorectal fistula there was a fistula of the urethra at the penoscrotal junction. Urinalysis showed one plus albumin many pus cells and *Pseudomonas aeruginosa*. Roentgenograms of the pelvis showed metallic fragments over the right ileum some deformity from the old fractures of the pubic rami and moderate osteoporosis. An excretory urogram revealed bilateral renal calculi with moderate bilateral hydronephrosis and hydroureter on the right. The immediate management consisted of ambulating this bedridden patient. Intensive physiotherapy was begun and in two weeks the patient was able to walk with the aid of crutches. Three hundred units of hyaluronidase were given daily in an attempt to decrease the formation of renal calculi.

A cystoscopic examination showed multiple bladder calculi and a two-centimeter defect in the bladder neck which communicated with the rectum. In addition there was a one-centimeter sinus of the urethra at the penoscrotal junction. Litholapaxy of vesical calculi was done at this time.

In May 1953 a combined abdominoperineal Young-Stone type repair of the vesicorectal fistula was done. The patient remained in a prone position on a Stryker frame bed for two weeks in order to direct the urine through the suprapubic tube and allow proper healing of the operative area. Despite this effort the vesicorectal fistula recurred at the end of two weeks. This was the sixth failure to close the fistula.

In June 1953 intestinal obstruction occurred and a laparotomy was performed which freed numerous small bowel adhesions. At this time an appendectomy and excision of Meckel's diverticulum were also done. Despite the repeated failures to close the fistula the patient requested further attempts to effect some method of urinary control. If closure of the bladder defect and urethral fistula were successful, the patient would still be incontinent because of the destruction of the vesical sphincters and the use of a penile clamp or a urinal bag would be necessary. Ureterosigmoidostomy was impractical because of the loss of the rectal sphincter. The proctology consultant believed that a rectal sphincter could be constructed to hold solid feces but it would never be capable of holding urine. The formation of a substitute bladder as described by Gilchrist and associates seemed to be the solution to this problem (fig. 1). On 12 August 1953 a substitute bladder was made using the ascending colon and terminal ileum. The bowel was prepared for two days prior to surgery using 7 grams of neomycin and 10.5 grams of phthalylsulfathiazole (sulfathalidine) in divided doses. The sur

surgical procedure was difficult because of tissue reaction from previous surgery. The right ureter was dilated to about two centimeters in diameter and was filled with purulent urine. A silastic ureteral catheter was used in the left ureter but not in the right. The anastomosis of the ureter to the cecum was the mucosa-to-mucosa type. The postoperative course was unremarkable. A retention catheter in the substitute bladder provided continuous drainage. The wound healed primarily, and the ureteral splint was removed on the fifth postoperative day.

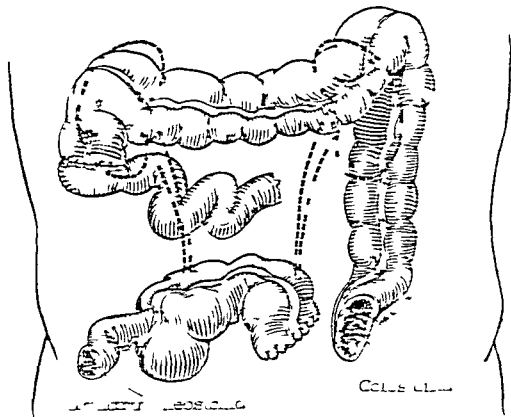


Figure 1. Showing bladder made from cecum and terminal ileum.

There was considerable epithelial debris and mucus during the first weeks but this cleared as the "bladder" adjusted to its new role as a receptacle for urine. The patient irrigated the bladder daily with a bicarbonate solution. In September he had severe right renal colic and pyelonephritis. He spontaneously passed a calculus measuring a half centimeter, which was recovered from the "bladder." In October a cystoscope was inserted into the substitute bladder but, because of peristaltic movements, palpation of detail was poor. The left ureteral orifice was patent and there was reflux up the left ureter. There were no infections nor pyelonephritis following this procedure. The patient was ambulatory, comfortable, continent, and gained

weight daily. On 15 September his blood urea nitrogen was 33 milligrams per 100 cc whereas on 2 November it was 20. Hemoglobin was 14.3 grams. Carbon dioxide was 25.6 mEq sodium 144 mEq and potassium 5.8 mEq. The bladder comfortably accommodated 10 ounces of urine and it is expected that the capacity will increase. The patient catheterizes himself every four to six hours and sleeps all night without leaking urine.

The patient was discharged from military service on 30 November 1953 to be followed by the Veterans Administration facility in his home area.

SUMMARY

A substitute urinary bladder is a practical solution for the diversion of urine in certain cases where ureterointestinal transplants are indicated. A case is presented in which severe trauma, an incompetent anal sphincter, and repeated surgical failure to close a large vesicorectal fistula created a new indication for a substitute urinary bladder.

Substitute bladders described in the literature were made mainly because of carcinoma of the bladder, neurogenic bladder, invasive carcinoma of the cervix, and vesicorectal fistulae following radiation necrosis.

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MODERN MEDICAL LITERATURE

The guess has been made that 5,000 (medical) periodicals published in a single year might represent about 11 million pages. If these pages were stacked one upon the other, the pile would tower 365 feet into the air and if laid end to end would reach 1,800 miles from Chicago to Seattle. It may readily be seen what height could be reached statistically with these figures.

—NATHAN FLAXMAN, M.D.

J. Nat'l. Med. Assn. Vol. 41A, Oct.
p. 1410, Apr. 24, 1954.

Rendu Osler Weber's Disease

Report of a Probable Case

RICHARD E. GREEN, Captain, USA

HEREDITARY hemorrhagic telangiectasia (Rendu Osler Weber's disease) is a well recognized but somewhat rare disease entity. Rendu,¹ Osler,^{2,3} and others⁴⁻⁷ have described the disease in various forms. In 1950, Garland and Anning⁸ reviewed the literature and found references to 267 families suffering from this malady.

The disease tendency seems to be inherited as a dominant characteristic but generations may be free from the disease, as emphasized by Fitz Hugh.⁹ The sexes are equally affected and either may transmit the disease. Common sites of bleeding are the surfaces of the hands and fingers, nail beds, lips, ears, tongue, nasal septum, buccal mucosa, floor of the mouth, conjunctivas, scalp, eardrums, palate, and pharynx; however, bleeding from the larynx, trachea, esophagus, stomach, intestines, bladder, liver, kidneys, meninges, brain, spleen, and urethra have been described.^{10,11}

The most common symptom is recurrent epistaxis arising from telangiectases of the nasal mucous membranes. The telangiectases are often noted in childhood, tend to disappear and return during the third or fourth decade. Following repeated episodes of hemorrhage a profound secondary anemia usually results. In some instances, splenomegaly occurs, probably a result of the chronic anemia.¹² The isolated hemorrhages usually cease either with treatment or spontaneously. A few instances of exsanguination during bleeding episodes, however, are recorded in the literature. The overall mortality rate is about four percent.¹³ In a few cases, liver disease (cirrhosis, periportal fibrosis, fatty infiltration, venous congestion, and biliary dilatation) have been recorded.^{12,14} Bradel¹⁵ stated that the triad which must be fulfilled before the diagnosis of hereditary hemorrhagic telangiectasia can be made is (1) inheritance, generally dominant without sex linkage; (2) multiple telangiectases; and (3) recurrent hemorrhage from telangiectases. However, as emphasized by Fitz Hugh¹⁶ and Gambill,¹⁷ inheritance, in an otherwise typical case, cannot always be proved.

Schuster and Bean described the basic pathologic lesion. In essence it is a thinning of the vessel wall particularly the muscular coat resulting in a bulging or ballooning of the wall at the site of the defect. Schuster reported that separate groups of dilated vessels are not permanent but vary from time to time in number size and tendency to bleed may even disappear completely. In 1930 Boston reported three cases of this disease and noted that the blood examination (including bleeding time clotting time and platelet count) was normal except for secondary anemia in the three patients.

Telangiectases of the gastrointestinal tract have been reported on several occasions the first one being Osler's case. Telangiectasia has been noted on sigmoidoscopic examination.² Renshaw in 1939 was the first to report such findings noted at gastroscopy.

In many instances hemorrhage from telangiectases occurs during childhood but is usually of a mild form. During the third and fourth decades hemorrhages recur the telangiectases become more prominent and numerous so that the severity of bleeding increases. Trauma of any form (such as blowing the nose) precipitates hemorrhages due to rupture of the endothelial lined vascular spaces. Spontaneous cessation of bleeding is generally the rule.²

Various forms of treatment including electrolysis roentgen rays radium micro injection of sclerosing solutions parenteral snake venom vitamin P rutin blood transfusions, bland diet and cauterization of local lesions have been recommended from time to time. In general treatment is not satisfactory. The use of rutin has been efficacious in several cases of hemorrhage from gastrointestinal telangiectases.

It is our purpose to report a probable case of gastrointestinal telangiectases treated recently in this hospital because of massive gastrointestinal hemorrhage.

CASE REPORT

A 33 year old married woman was admitted to this hospital on 10 November 1953 as a transfer from a nearby U S Air Force hospital because of massive gastrointestinal hemorrhage.

The past history dated back to March 1948 when the patient first experienced massive melena. Because of recurrent massive melena requiring numerous blood transfusions the patient was operated on in June 1948 at a civilian hospital. The operative report indicated that the small intestine revealed marked varicosities. Gastrotomy with exploration of the stomach and duo-

denum, had been unrevealing. No definitive operation was carried out.

Between June 1948 and November 1953, the patient was hospitalized on at least 24 separate occasions because of massive gastrointestinal hemorrhage manifested by marked melena, faintness, weakness, and anemia. At no time was there hematemesis. On all occasions the patient received from one to several blood transfusions and the gastrointestinal hemorrhage apparently ceased spontaneously. She was frequently treated for chronic secondary anemia with vitamin B₁₂, iron, folic acid, blood transfusions and various assortments of vitamins. Likewise, she had repeated gastrointestinal barium studies, gastric analyses, proctoscopic and gastroscopic examinations, and blood studies, including bone marrow evaluations. These studies were reportedly normal with the exception of the persistent chronic secondary anemia and evidence of pylorospasm on two separate upper gastrointestinal barium studies.

On 13 July 1953, the patient was hospitalized at a nearby service hospital because of massive gastrointestinal hemorrhage. During the following month, she received several blood transfusions and underwent numerous studies in an attempt to find the cause of the melena. On 21 August 1953, the patient was again operated on in an effort to determine the cause of hemorrhage. The following is taken from the operative chart: "Thorough exploration of all abdominal organs was carried out. The liver, spleen, duodenum, and gallbladder were normal. The stomach was opened through a longitudinal incision and the duodenum and stomach inspected. There was no evidence of either a recent or healed peptic ulcer and no polyps. The gastrostomy was closed. The entire bowel was carefully inspected from the ligament of Treitz downward and extending the length of the jejunum and about one half of the ileum, large varicosities were seen, some running parallel to the bowel axis and others at right angles to it. About 15 feet of the small bowel were involved. No abnormality could be noted in the mesentery except for a few enlarged lymph nodes. The pressure in one of the large mesenteric veins was measured and found to be 18 cm. of water. The large bowel was normal." No definitive therapy was carried out. The patient was subsequently discharged from the hospital but because of the recurrence of massive melena was readmitted and transferred to this hospital on 10 November 1953.

Past history indicated that as a child the patient experienced frequent episodes of "bloody diarrhea." These episodes continued until the patient was about five years old. There was no specific history of bleeding tendencies or hemorrhagic episodes in the patient's immediate family.

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Hopk ns Hosp. 20 63-73, Mar 1909

PSYCHOTHERAPY IN HYPERTENSION

I think that psychotherapy is not indicated in the treatment of hypertension but it is indicated for most patient who have hypertension. I put it another way high blood pressure in itself is not an indication for psychotherapy because I know of no evidence that the psyche is responsible for the disease hypertension or that psychotherapy can alter the course of hypertensive vascular disease. On the other hand I feel quite certain that the symptoms attributed to hypertension frequently arise in a social setting of emotional stress and that those symptoms are then frequently blamed upon hypertension which is discovered in the course of the physical examination. Then often as you well know we add to the problem of hypertension by the creation of a blood pressure phobia and of course when that happens there is an indication for psychotherapy and psychotherapy can remove and often does remove many of the symptoms that are attributed to hypertension.

Psychotherapy can be performed by the average physician and indeed it seems to me that in most cases it must be. Some of the profound personality disturbances in hypertensive patients do not yield to even prolonged psychotherapy and the patient in addition to his high blood pressure has the problem of long continued psychotherapy and the difficulties that often arise out of it to contend with. Of course every case must be judged individually but in general I would urge that the average physician be prepared to treat his hypertensive patients for the symptoms which are of emotional origin and not confine himself to an effort to reduce the blood pressure.

—EDWARD WEISS M D

B l l t f th N w Y k A d my J M d c
p 378 May 1954

Corkscrew Esophagus

PAUL A. PADEN Colonel MC USA

THE multiple irregular indentations, contractions, or dilations of varying degree and constancy occasionally seen in the lower half of the barium filled esophagus have been described by many terms, such as reflex spasm, spastic pseudo-diverticula, segmental spasm, pseudodiverticulosis, functional diverticula, tertiary contractions, crinkling, curling, rippling and corkscrew esophagus¹⁻³. The phenomenon is little known outside the field of roentgenology, as there are usually no associated symptoms though there may be dysphagia or chest pain¹⁻³. If pronounced, the changes may persist for years. Relationship of the milder, more transient form seen in elderly people, and frequently in cardiospasm, to the pronounced changes giving rise to a corkscrew appearance is not clear. The cause is unknown. Localized inflammatory changes in the esophagus arising from surrounding structures, reflex spasm from intra-abdominal or laryngeal disease, changes in the central nervous system, and neuromuscular imbalance have been advanced as causes. Reports of histological examination are very rare and have shown only slight fibrosis^{2,3,4}. As no report of autopsy findings in a patient with pronounced changes has been found, the following case is presented.

CASE REPORT

A 41 year old man suffered an anteroseptal myocardial infarction from which he promptly recovered all abnormal electrocardiographic changes completely disappearing. Because of anginal type pain, occurring only after retiring, he was examined for hiatus hernia. Pronounced corkscrew deformity confined to the distal third of the esophagus and a small hiatus hernia were found (fig. 1). There was no obstruction to flow of the barium and no dysphagia. Convalescence continued until a fatal posterior myocardial infarction three weeks later.

Autopsy findings. At autopsy the expected changes in the heart and aorta were found. There was no herniation at a small esophageal hiatus. The esophagus was very mobile and possessed scarcely any fibrinous or muscular attachments. It was about five centimeters longer than usual and deviated to the right. The mucosa was intact and extended well into the cardia. There were

mal longitudinal rugose striations. The wall was not thickened and was free of scarring or other defects. Five sections taken from various levels and from the esophagogastric junction were

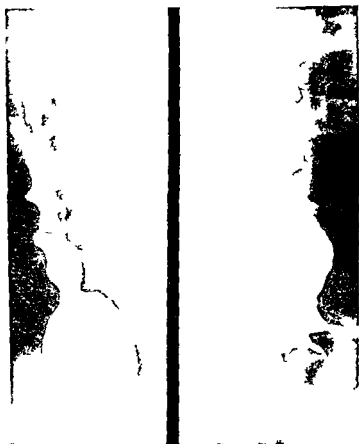


Figure 1. Normal longitudinal section of the esophagus showing the normal longitudinal rugose striations and straight longitudinal folds. The thickness of the wall is normal.

studied microscopically (fig 2). The mucous membrane was intact and not inflamed; the muscle fibers were normal and there was no fibrosis. Elements of Auerbach's plexus were very conspicuous throughout, but no elements of Meissner's plexus were found.

DISCUSSION

Significance of the sparsity or absence of elements of Meissner's plexus and the apparent increase or hypertrophy of the elements of Auerbach's plexus is difficult to evaluate. Though both are normally present in the esophagus, textbooks of his-

tology and surgical pathology make little or no comment concerning them. Inquiries from several pathologists have revealed that particular attention is usually not paid to them in this location. At best their function is not well understood and question as to whether or not they are a part of the autonomic system has been raised.⁷ If they are, the changes are important, for Knight⁸ has shown that functional activity of the esophagus is dependent



Fig. 2. Photomicrograph of a section of the esophagus stained for biopsy ($\times 12$).

on its extrinsic nerve supply, the parasympathetic stimulating peristalsis and opening the sphincter, and the sympathetic causing inhibition of peristalsis and constriction of the sphincter. Until other similar cases have been studied, definite conclusions cannot be drawn. The changes do seem to support the neuromuscular imbalance theory. That the contractions only occur in that portion of the esophagus which has a dual nerve supply and can be markedly diminished or temporarily abolished by such drugs as amyl nitrite, amphetamine (benzedrine) and atropine is additional evidence for the theory. Localized inflammatory changes suggested by Schatzki⁹ as a cause when he proposed the term "krauselung" (Schatzki¹⁰ does not consider "curling" a proper translation) were not present. As the changes occurred when cardiac disease was quiescent, reflex spasm does not seem a likely explanation. Johnstone¹ stated that there is always an

associated hiatus hernia when the contractions are marked. He believed this occurs because uncontrolled contractions of the longitudinal muscles shorten the esophagus in a concertina like fashion. In life that portion of the stomach into which esophageal mucosa extended was probably contained in the thorax and caused the appearance shown in figure 1. Inability of the pathologist to demonstrate herniation is not considered significant for disparity of findings in the area of the esophageal hiatus during life and at autopsy is well known.¹

SUMMARY

Absence or extreme sparsity of elements of Meissner's plexus, apparent increase or hypertrophy of the elements of Auerbach's plexus, and increased length of the organ were the striking post-mortem findings in a patient with corkscrew deformity of the esophagus. No fibrosis and no adhesions were present. Significance of the changes cannot be stated conclusively but they seem to support the theory that such contractions are due to neuromuscular imbalance.

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ANGEL OF DIEN BIEN PHU FETED BY CHIEF NURSES OF MILITARY SERVICES



Lieutenant Colonel G. J. T. Traube, French, being of the Bie Ph (condom) is shown with the chief nurse of the three military services, Colonel V. M. Z. II. USAF 1st Colonel R. by F. By 1 USA and Capt. L. na J. h. n, USN standing before the memorial of the Red Cross Nurse D. la during a reception at the headquarters of the American Red Cross during the Vietnam War at Washington, D.C.

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(The following letter was filed by Dr. H. U. d. A. R. k. Chawm
m. f. tb. Nat. al. H. lth. R. ur. Advn. ry. C. mmitt. nd is p. bl. b. d.
u. th. the. u. st. p. m. n.—Ed to.)

Dea Do t. Rusk—The Bo d of Veterans Appe ls n need of
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It w ll be gr atly apprec t d if the ab v inform tion is brought
to the att ntion of ll compete t medical ff cers who are leav ng
active s rvce n order th t they might get in touch with th s office
f interested

R. L. JARNAGIN

Chaim B d f V t s App l

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A MESSAGE FROM THE A M A

In view of its increasing importance to physicians in the military service and the publicity which has been given to legislation introduced during the present Congress, a brief review of the past and present policy of the American Medical Association with respect to the provision of medical care for dependents of members of the armed services is in order

The House of Delegates of the American Medical Association, in December 1953, approved the provision of medical care for dependents of service personnel in military facilities and by physicians in uniform in overseas areas and in areas in the United States where civilian medical facilities and personnel are either unavailable or inadequate, but at the same time the House opposed the drafting of physicians to provide medical care for the dependents of service personnel in areas where civilian facilities are available

The Board of Trustees at its meeting on 15 February 1954 expressed the belief that medical care should be provided dependents of service personnel by (1) military physicians in military facilities in overseas areas and in remote areas in the United States where civilian facilities are unavailable, and (2) civilian physicians in civilian facilities in all other situations

The Board recommended further that the method of defraying the cost of the latter type of medical care should be through an additional allowance for military personnel with dependents which would permit the purchase of prepaid health insurance, such an additional cash allowance to be paid only in an allotment to an insurance company (nonprofit or commercial) if authorized by the serviceman. Finally, it was recommended that legislation be enacted authorizing payroll deductions to permit the payment of premiums for health insurance to the commercial or nonprofit insurance company designated by the serviceman

In June of 1954, the Board of Trustees and the House of Delegates again reviewed the policy on dependent medical care. The Board at its meeting of 20 June 1954 recommended to the House of Delegates that "medical care should be made available for dependents of service personnel in the following manner (1) By military physicians in military facilities in overseas

F m th C un l o National Em rg cy Medical Service of the Am rica Medical
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areas other than United States territories or possessions and in remote areas in the United States where civilian facilities are unavailable (1) By civilian physicians in civilian facilities in all other situations This position was approved by the House of Delegates on 23 June 1954

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AMERICAN PUBLIC HEALTH ASSOCIATION MEETING IN BUFFALO, 11-15 OCTOBER 1954

The American Public Health Association will hold its 82d annual meeting at the Statler Hotel in Buffalo N Y, 11-15 October 1954 under the presidency of Hugh R. Leavell, M D, professor of public health practice at the Harvard School of Public Health.

Colonel Dwight M. Kuhns, MC USA, chief consultant in pathology and allied sciences to the Surgeon General, is secretary of the laboratory section. Lieutenant Colonel Alvin F. Meyer, Jr. USAF (MSC) Offutt Air Force Base, Nebr. is chairman of the Committee on Industrial Sanitation and Captain Van C. Tipton (MC) USN, Bureau of Medicine and Surgery, Washington D C is chairman of the Subcommittee on Radiological Health.

Speakers from the military services who are scheduled to appear on the scientific program include:

Epidemiological Investigations With Respiratory Disease Virus RI 6—Maurice R. Hilleman, Ph. D. Capt. Harry E. Dascomb MC, USAR. Jacqueline E. W. rne M. S. Department of Virus and Rickettsial Diseases Army Medical Service Graduate School, Washington, D C. First Lt. Richard L. Butler MC USAR Fort Dix N J. Capt. John J. McCue MC, USAR Fort Ord Calif. and Capt. Robert Stragnell MC USAR Fort Leonard Wood Mo.

Tb Evaluation of Serological Tests for Syphilis in Hansen's Disease—John F. Kent Ph. D. Chief Robert E. Harrigan and A. Garcia Otis M. D. Department of Serology Army Medical Service Graduate School, Washington D C.

The Standardization of Diagnostic Methods for Gonorrheal Infections—Lt. Col. Paul S. Parrino MC USA U S Army Hospital Camp Kilmer N J.

Oral Penicillin Prophylaxis of Epidemic Streptococcal Infections—Comdr. John R. Seal (MC) USN Head Communicable Disease Control Section, Bureau of Medicine and Surgery Department of the Navy Washington D C.

Incidence of Serologic Types of Escherichia coli Associated with Infantile Diarrhea Among Pediatric Patients in the Denver Area—Maj. Charles D. Grabe J. MSC USA Bacteriology Section Fitzsimons Army Hospital, Denver Colo.

Study on the Etiology of an Outbreak of Infantile Diarrhea—Lt. Col. Robert B. Lindberg MSC USA Department of Bacteriology Army Medical Service Graduate School, Washington, D C. Wilford D. Belknap M D Fort Belvoir Va. and Joel W. rren, Ph. D. Chief Department of Bacteriology Army Medical Service Graduate School Washington D C.

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BOOK REVIEWS

ELECTROCARDIOGRAPHY by *E Gey Dimond* M D 261 pages 272 illustrations The C V Mosby Co St Louis Mo 1954 Price \$14

The author's preface states that this book has been written solely for the general practitioner and the medical student with the intent of carrying such an audience from a totally uninitiated stage to a fairly sophisticated level. Toward this end the volume represents a significant contribution. Beginning with the actual recording of an electrocardiogram practical and reasonably detailed attention is given to problems of technic and the acceptable American Medical Association standards of direct writer performance. Technicians and supervisors alike will profit from this section. A lucid discussion of the classical concepts of electrocardiography follows. With it are mingled those three dimensional concepts of the vector loop and spatial vector electrocardiography which clarify its understanding. To an unusual degree the book encompasses and integrates the various theories of interpretation. The last section applies these integrated principles to the diagnosis of heart disease. The reader is entertained and stimulated by the method of quoting in a final chapter the divergent and contradictory opinions of several authorities who define their criteria for the electrocardiographic diagnosis of left ventricular hypertrophy.

The format and illustrations are superior. The book will be of particular value to instructors and students of electrocardiography.

—ROBERT B DICKERSON Lt Col MC USA

THE HISTORICAL ROOTS OF LEARNING THEORY by *Horace B English* 21 pages illustrated Doubleday & Co Inc Garden City N Y 1954 Price \$0 65

At last someone has reviewed the historical roots of contemporary learning theory in a manner that can hold the interest of the average student whether or not he is studying educational psychology. It is refreshing to find a writer who does not feel compelled to expose this esoteric subject in all its formidable complexity and who is able to simplify where simplification will help the reader grasp the point. The author's style is conversational and informal. The pamphlet reads as if someone had taken down verbatim a final review lecture in an elementary course in learning theory. The review touches upon French, English, and German contributions and traces the development of learning theory chronologically. There is a brief interpretation of the contributions of the various schools of psychology to this subject. The author ends with an appeal for experimental programs in a field which he believes requires and justifies further exploration.

—THEODORE C KAHN Maj USAF (MSC)

TOXICITY OF INDUSTRIAL ORGANIC SOLVENTS by *Ethel Bowles* 411
 pag Chm I P bl h g Co I N w Yo k N Y 1953 Pr c \$8

This book is a revision of a report compiled by the author and issued in 1937 by the British Medical Research Council on the toxicity of volatile organic solvents which have wide pread industrial use. It is a compend of up-to-date information gathered from the literature on the effects of 126 compounds on both animal and man to aid in the avoidance of poisoning from their use. Treatment of intoxication is also outlined and there are two chapters devoted to hydrocarbons, one each to alcohols, ethers, esters, ketones, glycols and their derivatives, amines and coal tar bases and nitrocompounds, and one chapter devoted to miscellaneous compounds including carbon disulfide, acetic acid, acetic anhydride, cresols, dimethyl sulfate and silicones and silane intermediates.

The material presented indicates that great care was used in the selection of the references and preparation of the data. It is well documented throughout but no attempt is made to evaluate critically the data presented. Over 800 references are cited in the bibliographies covering the two chapters on the hydrocarbons. On the less commonly used solvents the bibliographies are shorter. The author has called attention to the fact that many experiments have been made with little direct relation to conditions that might possibly occur in industry. In a number of instances, however, such sources provided the only data available and therefore were included according to the author partly for completeness and partly for such evidence as they afforded.

There is a well prepared index. The physician concerned with maintaining the health of the worker in industry will find this book a especially useful reference on his bookshelf.—ROBERT H DUGUID, M.D.

WINE AS FOOD AND MEDICINE by *Stefan P. L. de Meuldre* 149
 pag Th Blak Co I N w Y rk N Y 1954 Pr c \$3

This is an authoritative treatise on wine discussing the chemistry, physiologic effects on various systems of the body, the nutritive value and the detailed indications for its use in specific medical conditions. The discussion of the chemistry and especially the physiologic effects of various types of wines gives the physician information on the potentialities of wine as a therapeutic agent. In discussing nutritional value of wine the author brings out interesting facts that are relatively little known and presents indications for its use in certain conditions. The final chapters discuss the administration of wine in various diseases, especially its use for the aged and convalescent patient.

This book not only provides enjoyable reading but will greatly add to the physician's concept of the use and values of wine not commonly considered heretofore and as such should prove a good addition to his medical reference library. It contains an extensive bibliography.

—DANIEL J WALIGORA, COL MC USA

PEDIATRIC PROBLEMS IN CLINICAL PRACTICE by *H. Mchael Smith*
Ph D with 14 contributors 310 pages Grune & Stratton Inc New
York N Y 1954 Price \$5.50

In this book of thirteen compact concise monographs by well known authorities the writers attempt in their own style to bridge the gap between usual medical treatment and complete therapy for the individual patient. The first two chapters on the normal child and the sick child serve as a general introduction and are particularly directed to social workers and teachers concerned with the health and welfare of children. The chapters continue arranged in logical sequence in fields such as the emotionally disturbed child schizophrenic child the mentally retarded child and the brain injured child so frequently neglected in the hustle of a busy practice.

Each is written in a different readable manner with variable bibliographies at the end of each monograph. A chapter on the cerebral palsied child is the most compact treatise on this subject the reviewer has had the pleasure of reading. It not only emphasizes the basic purpose of this book but reviews the subject well for the pediatrician psychologist social worker and teacher alike. A short chapter on the orthopedically handicapped child follows with an excellent outline of the rehabilitation program and the part each member of the medical team plays.

The last five chapters concern more specific problems of allergy, cardiac disease diabetes epilepsy and tuberculosis in children.

This book would be particularly useful to teachers in the field of the exceptional child. It would serve to remind the physician to consider the child as a whole and to follow each child as a member of the medical team to that point from which the patient can be his own and attain maximum productivity physically mentally, and socially in his particular environment. —JOHN P. FAIRCHILD *Med Res Div*

COUNSELING THEORY AND PRACTICE by *Harold B. Pepinsky* 307 pages The Ronald Press Co New York 1954 Price \$4.50

they have earlier treated the neobehavioral viewpoint expanded however to include behavior phenomena apparently most frequently encountered in the college level guidance or counseling centers

Although this reviewer is impressed with the detailed scholarly approach maintained throughout he is beset with the problem of too little and too much being said in some instances For example one who has had limited prior contact with comparative behavior theory would gain little from the over simplified and limited coverage of the five major approaches to counseling On the other hand a person already reasonably competent in neobehavioral concepts would be apt to believe that the earlier chapters are wasted and might desire more than suggested the practices or technique levels of counseling At the practices level there appears to be an assumption that client problems are almost exclusively of a relatively simple or not too complex nature

Despite these criticisms the book is recommended to those who are looking for guidance in the formulation of theoretic models in communicable and stable forms and/or those interested in a pioneer attempt to expand the learning viewpoint of considerable prominence as well as to those about to begin their training in the counseling process

—JAMES W LAYMAN M J MSc USA

THE HEPATIC CIRCULATION AND PORTAL HYPERTENSION by Ch I
G Ch Id III M D 444 p g Illustrat d W B Sa d C Ph I
d lph P 1954 P \$12

A physician confronted by a patient with portal hypertension scites esophageal varices esophagogastric hemorrhage may easily orient himself by studying the excellent diagrams graphs reproductions case abstract and discussion of medical as well as surgical therapy printed in this book Mercurial diuretics low salt diets cation exchange resins serum albumin and the use of endocrine product are presented in a practical manner The role of the liver in shock and the effect of hepatic disease are vividly explained

Percutaneous splenic puncture with portal venography and operative manometry and venography are described and well illustrated The effects of hepatic arterial and/or portal venous exclusion are summarized An interesting suggestion is arterialization of the portal vein by means of vein graft between the aorta and hepatic end of the portal vein in conjunction with an end-to-side Eck fistula Procedures not involving production of shunts are likewise amply illustrated Very illuminating are the illustrations of pathologic findings exploits of experimental operation and case descriptions

General practitioner internists gastroenterologists and general surgeons will find this an outstanding and valuable book

—JAMES B SEAMAN Lt Col MC USA

FLEISCH'S HANDBOOK OF DIFFERENTIAL DIAGNOSIS edited by A. C. W. F. Fleisch, M.D., D.Sc. This edition, 1954, contains 1,000 pages with 100 illustrations of which 100 are in color. The illustrations are by A. C. W. F. Fleisch, M.D., D.Sc. Price \$20.

This volume is a treatise on the application of differential diagnosis to the principal signs and symptoms of a disease. It covers the field of medicine, surgery, gynecology, ophthalmology, dermatology, and pediatrics. This new edition, after a lapse of 10 years, is completely revised without excess or repetition or overstatement.

Signs and symptoms are presented in a systematic sequence as in previous editions. Common, less common, and rare conditions are discussed. Throughout the text an effort is made to correlate pathologic lesions and physical or chemical changes with the clinical manifestations. Newer diagnostic tests and procedures are presented and obsolete material deleted. Treatment is discussed only when it serves in establishing a diagnosis. The articles are clear, brief, and to the point.

In an effort to maintain a single volume work, the has been reduced in size and this may be found objectionable to some readers. The index is complete and comprehensive, covering 150 pages. It gathers symptoms under the headings of the various diseases in which they occur. The number of illustrations has been increased and about one third are in color. Color plates have been improved, especially those depicting dermatologic and hematologic conditions. Foreign language diagnosis by special methods is incorporated under appropriate sections throughout the text. The plates are clear and easily read.

This volume maintains the standard of excellence achieved by previous editions and is recommended as a reference medium for the medical student, the general practitioner, and the specialist in their daily work.—WILLIAM STEIN, LE COL, MC, USA

FIRST AID AND RESUSCITATION by Carl F. C. Murphy, M.D., M.P.H., 195 pages, illustrated, Charles C. Thomas Publisher, Springfield, Ill. 1954. Price \$2.00.

The purpose of this manual is the conservation of human life. For this purpose the author has devoted well-written chapters each concerning the management of some present type of emergency. Written primarily for rescue squad, fireman, policeman, and labor crews, interns, and industrial crews, this is the best manual dealing with this vital aspect of medicine that the general practitioner has the opportunity to read. It is of equal interest to the practicing physician, judging from many patients seen in the emergency office and wards of the average hospital who had been injured at the scene of the accident or emergency and had not been treated in a hospital. The book is essential first-aid car.

The subject matter is briefly, clearly, and lucidly presented. Only elemental physiology and medicine have been used; these are,

however so clearly stated that they can be readily understood by those who have had no training in medicine or related fields Chapter 6 consisting of 48 pages which concerns the transportation of the seriously ill or badly injured patient should be required reading for every ambulance driver and crew This valuable book should be made available to every group interested in the field of first aid and resuscitation work —JAMES E GRAHAM Col MC USA

NARCOTICS AND NARCOTIC ADDICTION by D d W Mur Ph D d
V for H V g I M D 303 pag Illustrat d Cha l C Th ma
P bl h Sp g f ld Ill 1954 P \$7 50

This is a practical manual on narcotic addiction for professional workers such as government officials law enforcement officers (including the police narcotic and custom agent probation officers social and welfare workers prison and reformatory officials) attorneys criminologists the clergy and writers The book is not sufficiently comprehensive for use as a text for psychiatrists or toxicologists Probably the most complete and thorough book yet published on a subject about which folklore is more common than fact it should be of interest to physicians who desire a general knowledge of narcotics and narcotic addiction It is not a sensational book but is carefully written meticulously phrased and qualified in the fields where the authors recognize that factual material is thin

Methods of drug administration used by addicts because these techniques differ markedly from standard medical procedures are cited There are special chapters on the treatment of patient with drug addiction and on the addict of narcotic addicts The various drugs and their physiologic and psychologic effects on those who are addicted are described

Much of the information in the book came from studies made at the U S Public Health Service hospitals in Lexington Ky and Fort Worth Tex Controversial and debatable material has been admitted and should be extremely useful for the people for whose use it has been prepared —WALTER R d FOREST Lt Col MC USA

LOW BACK PAIN AND SCIATICA by L T P I mb M D 35 ll trat ns
104 pag J B L pp et C Ph lad lphia P 1954 P \$3

In the author's opinion low back pain with or without sciatica is increasing percentagewise as our industrialization broadens and transportation method expand He emphasized that important changes in our concepts of the causes and treatment of this condition have changed during the past 10 years The diagnosis of sacroiliac sprain lumbago fibrositis and fasciitis have generally given way to the conception that most of these patients are suffering from traumatic and/or degenerative changes in the intervertebral disk secondary to aging and to chronic minor trauma The newer anatomic and physiologic concepts of low back pain in turn have led to improved requisites for conservative and surgical management

A review of basic anatomic considerations and etiologic factors is followed by a detailed section on diagnosis. Intervertebral disk disorder is discussed in a special section and the studies indicated to prove or disprove the diagnosis follow. Conservative treatment is stressed because in the author's experience therapy is limited to nonoperative conservative measures in about 90 percent of the cases. Finally, there is a section on surgical treatment for the patients who fail on positive conservative treatment and/or in whom a definite congenital or acquired symptomatic lesion has been diagnosed. A bibliography of 122 references and an index are included.

This monograph is well written, clear, and easy to understand. It is highly recommended for all those interested in the problem of low back pain and who must constantly apply their clinical acumen to the management of this condition.—EDWIN J. PULASKI, Lt Col MC USA

FUNDAMENTALS OF NEUROPATHOLOGY by William B. Rooks, Dublin, M D
685 pages, illustrated, Charles C Thomas, Publisher, Springfield, Ill.
1954, Price \$18.50

This volume has been prepared with the purpose of presenting the pathology of the nervous system from the point of view of the general pathologist and in the language he is accustomed to use. In this effort the author has succeeded because he stresses the general similarities of the lesions occurring in nervous tissue to those in other regions of the body. The book is readable and its concepts are clearly stated. Wherever possible, lesions of the nervous system are discussed from the viewpoint of their cause or point of origin. The entire field of neuropathology, including related lesions or lesions with nervous system manifestations, is covered systematically along with chapters on methods of examination and normal and pathologic histologic findings. Clinical manifestations are considered only briefly in relationship to pathologic changes. The discussions are concise and the language often terse.

The information is for the most part authoritative and accurate. I would not agree as he states that sarcoidosis is noncaseating tuberculosis. The classification and terminology applied to tumors differs widely from common usage and were it not for the inclusion of better known terms, the reader might have difficulty in following the text. Neoplasms are discussed from viewpoint of cell origin, generally beginning with the most primitive type and working up to the most differentiated. The interrelationships between different tumors are thus clearly outlined.

The book is profusely illustrated with excellent black and white photographs. Three color photographs, however, leave something to be desired. There is an excellent bibliography of 496 references and the index is adequate. The volume is a fine contribution to medical literature and will be useful to anyone interested in the pathology of the nervous system.—HOWARD A. VAN AUKEN, Col MC USA

THE BIOCHEMISTRY OF CLINICAL MEDICINE by William S. H. J. J. J.
Ph D M D 681 pag Il trat d Th Y r B k P bl h I c
Ch g Ill 1954 P \$12

This book is offered with the purpose of orienting the general practitioner in clinical biochemistry and providing a review in basic science for physicians studying for various American specialty boards.

The author states that his approach is entirely didactic and because of this the bibliography furnished is limited. He believes it is possible to accomplish his objectives without using highly technical explanations and dogmatic chemical formulae. While this is obviously a large order, since for the most part successful treatment has been given to the material presented. Correlation of the laboratory and clinical findings in a large number of conditions including diabetes, water and electrolyte balance, kidney disease, liver disease, and malfunction of glands of internal secretion, as well as protein, carbohydrate, and lipid metabolism are discussed. Complete coverage of all these subjects from a clinical as well as biochemical aspect is impossible within such a short space, and the author necessarily makes some rather bold statements which may be disputed by many.

As a good starting point for orientation of the general practitioners and board aspirants, however, this volume serves a definite purpose and can be read with profit. The illustrations are simple and understandable. The style is good, although in the attempt to condense the material, the writer becomes a little obscure at times. This book is recommended as a good introduction and review in the less complex aspects of biochemistry as they relate to clinical medicine.

—ROBERT S. NELSON Col 1 C USA

PRINCIPLES OF VETERINARY SCIENCE by F. d. k. Bow, H. d. y.
D V M 5 h d 546 pag Il trat d W B Sa nd r C Ph la
d lph P 1954 P \$5.25

This book is intended for agricultural students and for practical livestockmen. It is not designed for professional veterinary students. The author attempts to draw a distinction between veterinary science and veterinary medicine. In this, the implication is made that the essential difference is a matter of legalization of collection of fees for services rendered by the veterinarian.

The book is divided into two parts: (1) anatomy and physiology, and (2) diseases. The encyclopedic parts are divided into 27 chapters and are characterized by superficial treatment of the subject matter and frequent errors of omission and commission. Included in the author's definition of manual handicrafts is castration of cryptorchids, ovariectomy, and correcting of dystocia. The reviewer believes that this book serves no useful purpose and is a source of dubious data and misinformation. —WILLIAM S. GOCHFLOUR J 1 C L VC USA

PNEUMONIA by *Hobart A Reimann, M D* 236 pages 19 illustrations Charles C Thomas Publisher Springfield Ill 1954 Price \$5.75

This monograph on pneumonia by one who has contributed signally to our knowledge of the subject is a clear readable resumé of the incidence causes and treatment of all forms of this disease

While there is not much that is really new in this treatise it serves to emphasize especially in the first chapter dealing with incidence that the total number of cases has not been materially lessened by the newer forms of treatment It also impresses on the reader that there are a great number of causes of pneumonia and that not every instance of clinical pneumonia as revealed by percussion the stethoscope or roentgenogram will yield to that particular wonder drug currently favored by the clinician The book therefore indicates that it behooves us to take a renewed interest in causes more specific treatment and pneumonia in general The fact that the eighth edition of Cecil's *Text book of Medicine* devotes only 28 pages to pneumonia whereas the seventh edition devoted 38 pages to the same subject is an indication of the lessening importance attached to pneumonia by the profession

Dr Reimann's monograph should serve to stimulate the reader to more accurate clinical appraisal of cases of pneumonia coming under his care Because in most cases the more specific forms of therapy currently available quickly render the sputum free of the offending bacteria it should also stimulate more thought along the lines of prophylaxis of a disease which despite this chemotherapeutic triumph still is practically as prevalent as before

The author discusses each of the many forms of pneumonia from pneumococcic pneumonia to pulmonary involvement in diseases of the collagen system giving the incidence causes pathology clinical symptoms diagnosis prognosis prevention and treatment of each form in which these factors are pertinent

—HUBERT H CARROLL *Capt. (MC) USN*

INTENSIVE GROUP PSYCHOTHERAPY by *G o r g e R Bach Ph D* 446 pages Th Ronald Press Company New York N Y 1954

This book describes both theory and practice of group psychotherapy The first section of the book is concerned with clinical technics of selection and guidance of group members as well as with how the therapist regulates himself in relation to the group This section is useful as a training manual for clinical operations particularly if it is combined with actual experience and supervision The author's attempt to delineate "do's and don'ts" for the therapist in the group therapy situation is sufficiently general for good clinical practice in any therapeutic situation and is well documented with case protocols

The other two sections of the book describe the therapeutic affects of group therapy and the factor of group dynamics in the therapeutic

process. The presentation of an eclectic theoretic framework for group therapy is admirable but sometimes ambiguous. The various concepts of field theory, Freudian and Sullivanian psychoanalysis, learning theory, and group dynamics are difficult for the reader to correlate until the author presents the clarifying concept of theragnosis. This concept explains the effects and processes of group therapy as a contact operation. The author draws heavily from his experience with Lewin's principles and concepts of field theory and group dynamics.

This book is a not worthy contribution to the field of group psychotherapy and would best serve as a primer for those learning this technique.

—JACK WERBOFF First Lt USAF (MSC)

HEADACHE. D. G. d. T. m. t. by R. b. t. E. Ry. n. M. D. 338 p. g.
 Il. tr. t. d. Th. C. V. M. sby C. S. L. M. 1954 P. \$6.50

Headache is a complaint daily related to the physician. The author has lucidly presented an evaluation of this common condition as a symptom of disease seen in all branches of medicine. This readable text approaches the subject by discussing the causes, symptomatology, and treatment with case histories as examples, and gives a brief outline summary of each chapter. A bibliography is included at the end of most chapters. Headache may be the primary or a secondary complaint in the patient's disease. Reference to this text will direct attention to the causative factors of headache and assist in the diagnosis of the patient's condition and his therapy.

The excellent typography and detailed outlining materially add to the effectiveness of this volume as a detailed reference. It is recommended for both the general practitioner and the specialist who desire to do something for the patients with headaches who consult them daily.

—EDWARD J. WHITELEY Lt Col MC USA

HISTOPATHOLOGY OF THE SKIN by W. L. F. L. M. D. 2d ed.
 518 pag. 281 il. trat. w. th 8 l. J. B. L. pp. t. C.
 Ph. l. d. lph. P. 1954 P. \$12

Since the publication of the first edition in 1949, this text has become an established guide for the graduate student in dermatology and a valuable reference for the general pathologist. The revised second edition contains an additional 69 pages, 60 new illustrations, and 56 new photomicrographs. Various sections have been rewritten and a chapter has been added. The non-infectious vesicular and bullous diseases have been grouped within a new chapter of 29 pages which reflect in a precise manner the present concept of the histopathology of these diseases. The bibliography for this chapter has been carefully selected; over half of the references have appeared in the literature within the past five years.

The chapter on pigmented nevi and malignant melanoma has been expanded, revised, and rearranged. The author has clearly defined the present concept of the histogenesis of the nevi cell. Whereas in

to be modified basal cells there is now almost complete agreement that they are neural cells which originate in the neural crest and migrate from there with the nerves to the epidermis during early fetal life. The great majority of investigators have accepted the theory first proposed by Masson in 1926 that both the melanocytes in the epidermis the so-called clear cells and the nevus cells are of neural origin."

New sections covering the following have been added to the second edition: hibernoma, hemangiopericytoma, beryllium granuloma, papular myxedema, prophyria and ochronosis. The author must be congratulated for improving an already outstanding text.

—CALVIN B. GALLOWAY, Capt (MC) USN

DISORDERS OF THE BLOOD by Sir Lionel E. H. White, M.D. and C. J. C. Britton, M.D., D.P.H. 7th edition. 856 pages with 20 plates and 106 text figures. Grune & Stratton, Inc., New York, N.Y. 1953. Price \$9.50.

The authors have succeeded admirably in the tremendous task of preparing a new edition of their standard textbook. We are living in an era of vast interest in hematology, as reflected both in the wealth of medical literature on the subject and in the number of international societies. Now that coagulation and immunohematology have come into their own, they are considered specialist fields.

The revision of a textbook of hematology requires the assiduous selection of bibliographical material with reconsideration of the sources used in the previous text. This was but one of the factors confronted the authors. The subject material has been brought up to date as of the middle of 1953. There is a new chapter on hematology and cytochemistry of hemopoiesis. New and informative material has been added and much revision has been done in the chapters on hemopoietic metabolism, therapeutics, coagulation, and the hemorrhagic diseases. The additions of immunohematology and discussion of the treatment of incompatible transfusion are of great value. The chapter dealing with blood groups, hemagglutination, and blood transfusion.

EAT THINK AND BE SLENDER by L. D. K. M. D. with h. t.
f. F. d. K. ne 223 pag. It with B. ks. I. N. w. Y. k.
N. Y. 1954 P. e \$2.95

This book was written to help obese patients gain the insight necessary to combat their problem. The central theme of the book is that obesity is caused primarily by an abnormal psychological attitude manifested by overeating. This point is made clear by repetition. The author rules out any metabolic and glandular causes in which many non-medical readers might believe. He presents a plan of reducing weight with a diet high in protein and low in fat and carbohydrate. Simplified menus are included showing how such a diet may be appealing and easy to prepare and can be bought at a restaurant. The discussion of metabolism is oversimplified. The need for medical counseling is stressed and the role of following the physician's advice in the case of anxious or refractory patients. Psychoanalysis is advised.

The book may help some of its readers; it may antagonize others who resent the obvious deductions to be made concerning their abnormal psychological outlook. The latter persons may become even more fixed and refractory. Written for the layman, the book is easily read. The reviewer doubts if it will make any great progress in solving the very serious problem of obesity.

—WILLIAM M. WEBB Lt Col MC USA

MAYO CLINIC DIET MANUAL by Th. Comm. D. t. f. th. M. y.
Cl. 2d d. t. 247 pag. W. B. S. and C. Ph. l. d. l. ph. i. a. P.
1954 P. \$5.50

This manual is a revised edition of an earlier one published by the dietitians of several hospitals of the Mayo Clinic and approved by the heads of the various departments. The diets are listed as to content of proteins, carbohydrates, and fat as well as minerals and vitamins. Any deficiencies that may be present are noted. A breakdown of types of foods presents those that may be included in the diet from those that should be excluded. Sample menus including a column of approximate measures are helpful in explaining diets to patients. This is a step in the right direction but an even better method is the use of a table of equivalents which is easier for the patient to use. The merit of this book, however, is to be concentrated, concise, and complete enough for use by dietitians and physicians.

The manual gives listings of all regular and special diets likely to be used today in a hospital with some excellent diets for surgical patients. It will quickly show the physician what his patient actually receives on a special diet and helps avoid the evil of a unique diet for each patient.

This volume, military service hospital diets, is a similar publication but because it is concise and out-dated, a volume such as this manual should be of great value to dietitians and physicians on active duty.

—JAMES L. TOBIN Col USAF (MC)

THE YEAR BOOK OF ORTHOPEDICS AND TRAUMATIC SURGERY (1953
1954 Year Book Series) edited by Edward L. Compere M D 362 pages
illustrated The Year Book Publishers Inc Chicago Ill 1954 Price
\$6

The purpose of this book is to present a concise resume of the journal literature foreign and domestic dealing with orthopedic and traumatic surgery for the year November 1952 to November 1953. This volume stands up well in comparison to those of previous years and is essentially the same in style and format. The editor accomplished this task by presenting brief abstracts of 233 selected papers. The subject matter is conveniently classified into 17 sections of well illustrated and accurately printed material. Emphasis is placed on articles dealing with basic research in a special section on Anatomy Embryology Pathology and Physiology of the Skeletal System.

It is perhaps inevitable that some readers will take issue over the choice of papers selected for inclusion in this volume. To this reviewer it appeared that several good articles published in 1953 were omitted from this edition at the expense of space devoted to case reports. Similarly several articles are abstracted which deal with reports of surgical results in very small series of cases.

An interesting feature is the editor's notes which are succinct and stimulate the reader's interest in the subject matter. A few of the comments will probably be at variance with the opinions of discriminating readers.

A warning should go with the book. It is not a substitute for reading the original articles. The well written abstracts are of necessity brief. As in all material taken from its original context they may be misleading to the uninitiated or to the reader not specializing in orthopedic. These criticisms are not meant to detract from the extreme usefulness of this volume. Doctor Compere is to be thanked and complimented for turning out a valuable addition to medical literature. The book is well worth its price and deserves a place in every surgeon's library.

—HERBERT A. MARKOWITZ C b (MC) 11511

LUNG CANCER by Seymour M. Faber M D 157 pages illustrated Chart 1
C. Thomas Publisher Springfield Ill 1954 Price \$4.75

In this monograph in pleasant scientific prose the etiology pathology and theory required for an understanding of lung cancer are simply but adequately outlined. Both sides of controversial points are given fair emphasis before the author states his opinion. As for example his belief that there has been a real increase in the incidence of lung cancer which he is not prepared to attribute entirely to carcinogens in tobacco. The lavish use of tar and petroleum products may prove more important in the genesis of this disease or constitutional factors such as metabolism and heredity may affect its incidence more than exogenous agents. The discussion of the etiology and chemotherapeutic therapy of bronchogenic cancer includes encouraging experimental

data which applies to all neoplastic disease. The morphologic types of pulmonary malignancies are killfully correlated with certain kinds of clinical behavior.

The section on clinical history, chest roentgenogram, and physical findings yield unexpected diagnostic tips, and the volume's readability and comprehension are facilitated by a avoidance of overly qualified statements. The discussion of the special diagnostic procedures elaborates on the technique of preparing sputum smears for cytologic study, and implies that this might well be included in periodic examinations of all men over 40 because it is the most useful diagnostic procedure for detecting operable cancer.

The chapter on surgery will be remembered for the discouraging statistic on operability. Barely 10 percent of those malignant tumors explored and resected are cured. Even if the speed and accuracy of diagnosis could be doubled, it appears that four out of five lung cancer patients will still remain beyond the help of the surgeon. Of special interest therefore is the splendid discourse on the management of inoperable patients, and the ray of hope that chemotherapy holds for the future.

This book is supplemented by figures of pathologic slides, roentgenograms, and cytologic stains of sputum smears, and contains an excellent bibliography. In it the author unintentionally reveals his stature as humanitarians as well as a scientist. It is recommended especially for the clinician equally concerned with people and theory.

—JACK C. SHRADER, Lt. Col., USAF (MC)

LABORATORY INSTRUMENTS. Third Edition. Applied by A. Ellitt, Ph.D., D.Sc., and J. H. McDuck, M.S. 414 pages. Illustrated. Chemical Publishing Co., Inc., New York, N.Y. 1953. Price \$7.50.

The purpose of the authors, according to the preface, is to present the principles on which good design of research instruments is based, with examples of the application of these principles. They did not attempt to cover the whole field of instrument design. This book contains much, however, which is neither design nor the application of design. For example, there is a rather sketchy chapter on materials, and a short chapter on the preparation of drawings. Both of these subjects are more adequately covered in many other readily available sources.

The book does not provide sufficient information to be of real value in completing an end product. The references mention their shortcomings because most are not readily available in libraries in the United States. The authors are prone to use brand names for materials, which is confusing to the many American readers. The volume would definitely be of some good use to the individual scientist attempting to design an instrument intended to objectively measure a specific effect. To some degree, it would also aid a group of instrument designers and makers.

—HENRY M. SWEENEY, Col., USAF

NEW BOOKS

Books received by the *U. S. Armed Forces Medical Journal* are acknowledged in this department. Those of great student interest will be selected for review in a later issue.

- WARTIME PSYCHIATRY** A Compendium of the International Literature edited by *Nolan D. C. Lewis* M.D. Director of Research in Neurology and Psychiatry, New Jersey State Hospitals and Agencies. Formerly Executive Head of the Department of Psychiatry, College of Physicians and Surgeons, Columbia University and Director, New York Psychiatric Institute and *Bernice Engle* M.A. Research Assistant, Langley Porter Clinic and University of California School of Medicine. 952 pages. Oxford University Press, Inc. New York, N.Y. 1954. Price \$15.
- NEW AND NONOFFICIAL REMEDIES** Containing Descriptions of the Articles which Stand Accepted by the Council on Pharmacy and Chemistry of the American Medical Association on January 1, 1954. Issued Under the Direction and Supervision of *The Council on Pharmacy and Chemistry*. American Medical Association. 609 pages illustrated. J. B. Lippincott Co. Philadelphia, Pa. 1954. Price \$2.65.
- ANATOMY OF THE BRONCHOVASCULAR SYSTEM** Its Application to Surgery by *George L. Brumbaugh* M.D. Chief Surgical Unit, Veterans Administration Regional Office, Portland, Oregon. Foreword by *Eva Is. A. Gahm*, M.D. Professor Emeritus of Surgery, Washington University, St. Louis. 300 pages illustrated. The Year Book Publishers, Inc. Chicago, Ill. 1954. Price \$15.
- THE PHYSICAL ENVIRONMENT OF THE FLYER** by *Dr. Heinz Haber*. Air University, USAF School of Aviation Medicine. 179 pages illustrated. Air University, USAF School of Aviation Medicine, Randolph Field, Tex. 1954.
- THE DIAGNOSIS AND TREATMENT OF THE INFERTILE FEMALE** by *Fred A. Simmons* M.D. Assistant Surgeon, Massachusetts General Hospital, Assistant Surgeon, Free Hospital for Women, Brookline, Mass. Instructor in Gynecology, Harvard Medical School, Boston, Mass. American Lecture Series Publication Number 220. A Monograph in American Lectures in Endocrinology. Edited by *Willard O. Thompson* M.D. Clinical Professor of Medicine, University of Illinois College of Medicine, Managing Editor, Journal of Clinical Endocrinology and Metabolism. Editor, Journal of the American Endocrinology Society. Chicago, Ill. 83 pages illustrated. Charles C. Thomas Publisher, Springfield, Ill. 1954. Price \$2.50.
- ULTRASONIC AND ULTRASHORT WAVE IN MEDICINE** by *Johannes M. Van Wazer* M.D. Director, Institute for Physical Medicine and Rheumatism, Amsterdam, with an Introduction by *Gerard J. Van der Pijl* M.D. F.A.C.P. Director, Parkway Medical Clinic, and Dept. of Physical Medicine, Jackson Memorial Hospital, Miami, Fla. 304 pages illustrated. Elsevier Publishing Co. New York, N.Y. 1954. Price \$9.

- HEART DISEASE AND INDUSTRY With Preface by R. F. W. R. K. M.
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October 1951

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Monthly Message

Guy de Chauliac was the last of the great mediaeval surgeons and is considered by some the greatest. Unfortunately however he denied the theories so well stated by Theodoric and Henri de Mondeville that wounds should heal by first intention and when clean and dry should be treated by primary closure. Guy considered this to be false teaching and went back to the authority of Galen in the use of large drains or tents to create suppuration. Nevertheless Guy's contributions were great and he believed thoroughly in the basic knowledge and *complete education* of a surgeon. Hence he states the four qualities of a surgeon

1 *Littre* which means that he should be educated and literary. He should understand the theory and practice of medicine, geometry, astronomy, philosophy and the natural sciences. Otherwise he is no different from an ordinary artisan.

2 *Expert* which means he should be expert in the use of his hands. He must wish to operate and understand the technique of operating.

3 *Intelligence* which means he should have good judgment and memory. He should have a firm hand and clear eye. He should have good intentions and should understand the subject of surgery.

4 *Moderation* which comes from the Latin *moderatus* and means compliant, agreeable, accommodating, anxious to please. He should be bold yet fearful of dangers. He should shun tricks and charlatans. He should be wise kindly, sober and compassionate. His fee should be moderate and formed in accordance with the task and the patient's ability to pay.

There is little to criticize in the above although today perhaps certain substitutions or additions might be made to these qualifications. I would call your attention particularly to the phrase. Otherwise he is no different from an ordinary artisan. That the physician and surgeon should be educated in the full sense of the word there can be no doubt and here one may adopt A. N. Whitehead's definition of education. Education is the acquisition of the art of utilization of knowledge.

Frank B. Berry

EFFICACY OF ERYTHROMYCIN IN THE TREATMENT OF ACUTE RESPIRATORY INFECTIONS

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ACUTE respiratory infections have constituted one of the major economic and administrative problems in military populations.¹ Recruits undergoing basic training have generally been more affected than other more permanent personnel on the base. Any means of prevention or rapid cure of these respiratory infections would be of obvious value. Because streptococcal infections have occurred frequently in military populations,²⁻⁵ considerable information is now available on their prophylaxis and treatment. The sulfonamides and most of the antibiotics have been shown to be of value in prevention and control of these infections as in other bacterial infections susceptible to the particular chemoprophylactic agent employed. The therapy of viral and related infections has to date been singularly disappointing as pointed out by Finland in a review article.⁶ The use of the available antibiotics in the treatment of the common respiratory diseases with nonbacterial causes has not been shown to alter the course of the clinical illness significantly.⁷⁻¹⁵

If an antibiotic were therapeutically effective it might be used either for prophylaxis or treatment of the infection in the manner that penicillin is used for controlling streptococcal infections in military populations. The present study was undertaken to obtain further information on one of the newer antibiotics, erythromycin, and to determine what effects its use might have on the course of the respiratory infections prevalent among recruits.

PATIENTS MATERIALS AND METHODS

Selection of Patients The 269 male Navy recruits included in the present study were observed and treated at one regimental infirmary of this training center between 7 November 1952 and 3 March 1953. As these recruits presented themselves at the various sick calls with complaints referable to the respiratory

tract it was first determined if the illness warranted admission to the infirmary ward. The main criterion for admission was an oral temperature of 100° F or greater although two patients who had exudative pharyngitis and temperatures below 100° F were included. The patients admitted were then assigned in strict rotation to one of the three treatment regimens as outlined below. No attempt was made to determine the exact diagnosis before assigning a patient to a treatment schedule. Only patients with respiratory infections were included and the only exception to the consecutive order of assignment was to eliminate men who had received antibiotic therapy for any reason within one week of the admission. Four patients were excluded from the final analysis: two were later found to have postinoculation reactions rather than respiratory infections and two were transferred to the naval hospital before completing one day of therapy.

Treatment Regimens The patients were assigned in rotation to one of the following treatment schedules:

1 *Erythromycin* On admission 200 mg of erythromycin were given by mouth; this was repeated every four hours thereafter for a minimum of three days. The total daily dosage was always 12 grams.

2 *Penicillin* On admission 300 000 units of penicillin G (aqueous crystalline penicillin G) and 300 000 units of aqueous penicillin G procaine were given intramuscularly. Thereafter each patient received 300 000 units of the penicillin G procaine preparation every 12 hours for a minimum of three days.

3 *Placebo* These were tablets identical in size, shape, and color to the erythromycin tablets and were given on the same schedule for a minimum of three days.

The patients were assigned to a treatment regimen by a hospital corpsman as their names were logged on admission; the tablets were dispensed by the ward nurses and corpsmen and the medical order sheet was not inspected during the patient's ward stay except in the event of a complication or delayed recovery. In this manner it was believed that as little prejudice as possible would be injected into the data comparing the erythromycin and placebo groups.

In addition to these specific treatment regimens all patients were given routine supportive and symptomatic therapy. This included bed rest until the patient was afebrile, nose drops and gargles when needed, and adequate fluids. The routine use of antipyretic drugs was specifically interdicted in all patients.

Clinical Observations Following admission to the ward each patient was interviewed for the pertinent facts of the medical

history, and a complete physical examination was made. In addition to the usual records, a separate marginal punch card was maintained for each patient to facilitate the tabulation of the clinical data. Ward rounds were made twice daily, at which time notes were made in the medical records and on the punch cards as to the status of the patient, persistence of symptoms or physical signs, unusual developments or complications, and reactions to the treatment given. Each patient's oral temperature was obtained four times daily, and the daily maximum temperature was recorded on the punch cards.

Laboratory Observations At the time of admission the following clinical laboratory procedures were performed on each man: total leukocyte count with differential blood smear, complete urinalysis, nose and throat culture, blood culture, and withdrawal of a 50 cc. blood sample. Sputum cultures and mouse inoculations were performed when indicated. The leukocyte counts were repeated each morning until they were persistently below 10,000 per cc. Other laboratory examinations were repeated as indicated. A second blood specimen was collected between the fourteenth and twentieth days following admission. A roentgenogram of each patient's chest was made upon admission, and repeated when indicated.

Bacteriologic, Virologic and Serologic Observations Cultures of the nose and throat were part of the initial laboratory testing of each patient. These cultures were obtained under direct vision with the aid of a strong white light in a miner's type head lamp. Additional cultures were obtained daily while the patient remained in the infirmary. Cultures were also obtained at convalescent follow-up visits on about the fourteenth and twenty-first days. All patients had cultures for at least four consecutive days, and the majority for six or more days. All cultures were processed by the techniques usually followed in this laboratory.¹⁷ Particular attention was paid to hemolytic streptococci, and all strains isolated were subjected to serologic grouping and typing by the precipitin method.¹

On admission, and again on the third hospital day, 5 cc. of blood were obtained aseptically, and cultured in 50 cc. of broth medium. These cultures were incubated at 37° C. for at least seven days, and any suggestion of growth as evidenced by hemolysis, darkening of the blood or turbidity in the medium was checked by streaking onto sheep's blood agar plates for identification of the bacterial species.

No consistent attempt was made to isolate influenza viruses from the patients in this study, but between 12 December 1952 and 13 February 1953 nasal washings were obtained from 24 patients whose illnesses the medical officer thought to be due

to influenza. The majority of these washings were obtained during the first two weeks of January. All were inoculated intramniotically into 13 day old embryonated eggs for the isolation of influenza viruses by the techniques usually employed in this laboratory.

The two blood specimens were used for determination of antistreptolysin O titers and for detection of antibodies against the PR8 FM1 Lee and 1953 prototype influenza virus strains. Where for any reason both sera from a patient were not available the single titer was disregarded. To be significant a rise in antistreptolysin O titer required an increase of 0.3 log (three tubes) or greater and in the Hirst hemagglutination inhibition test for influenzal antibodies a fourfold or 2.0 log rise in titer was required to be significant.

ANALYSIS OF CASES OBSERVED

Comparability of Populations. Because no regard was given initially to the admission diagnosis or medical history in assigning the patient to a treatment regimen it is important to assess the comparability of the populations in the three groups before comparing the results of the therapy given. In table 1 are listed certain of the pertinent facts of the medical history. Although minor variations did occur from one group to another they were not significant. In addition to the medical history calculations were made of the mean age, geographic origin and number of weeks in training. These also were about equal.

Diagnostic Criteria. At the outset of the study it was known that the final series of cases would include acute respiratory infections of various causes, most of them unknown. It thus became necessary to classify these infections into etiologic groups on the basis of the available clinical, bacteriologic, virologic and serologic data. For this purpose certain somewhat arbitrary criteria were established and the following diagnostic categories were included:

1 *Streptococcal infection.* (a) Exudative pharyngitis with a positive culture for a group A streptococcus; (b) any acute respiratory infection accompanied by a significant rise in antistreptolysin O titer; and (c) any acute respiratory infection with a positive culture for a group A streptococcus and a total leukocyte count of 16,000 per ml. or greater.

2 *Influenza.* An acute respiratory infection associated with the isolation of an influenza virus and/or a significant rise in influenza antibody titer.

3 *Pneumonia.* An acute respiratory infection with roentgenographic evidence of pulmonary consolidation.

4 *Respiratory infection of unknown cause (RIUC)* An acute respiratory infection with or without constitutional symptoms unrelated to the isolation of a streptococcus or an influenza virus, or to changes in antibody titers to these organisms (All infections which could not be classified into group 1, 2, or 3 were listed as RIUC)

TABLE 1 *Some aspects of medical history in 265 naval recruits with acute respiratory infections*

Treatment group	Number	Percent with history of				
		Tonsillectomy	Allergy	Recent upper respiratory infection	Rheumatic fever	Pharyngitis
Erythromycin	87	42.5	5.7	39.1	1.1	1.1
Penicillin	90	50.0	10.0	45.6	2.2	2.2
Placebo	88	48.9	10.2	45.5	3.4	1.1
Total	265	47.2	8.7	43.4	2.3	1.5

History of fever, HIV, asthma, or known drug allergies

Within two weeks prior to illness

It should be noted here that the incidence of recruits presenting themselves at the infirmaries seeking treatment for respiratory infections is more or less continuous. The actual admission rates for respiratory infections are greater in the winter months but unless epidemics are superimposed on the basic rates the distribution of infections by each diagnostic category remains about the same. During the present study there was an explosive outbreak of epidemic A prime influenza virus infections in this population, beginning the last week in December 1952 and extending through the early weeks of January 1953. The six A prime influenza virus strains were isolated and most of the rises in antibody titers occurred during this period. During the study there was no definite evidence of streptococcal infections being epidemic. The persons so classified were evenly distributed throughout the period of the study.

In table 2 are listed the number of patients in the three treatment groups who fell into each of the diagnostic categories. It is immediately evident that although the initial diagnosis had no effect on the assignment of a man to a treatment schedule, the numbers in each diagnostic group are about equal. More than half the patients in each group were thought to have respiratory infections of unknown cause. It should be pointed out here that it is entirely possible that some of these patients had had strep

TABLE 2. Frequency of erythema in patients with purpura

Disease	Total						Total	
	Erythema			Purpura			Total	
	Number	Percentage	Percentage	Number	Percentage	Percentage	Number	Percentage
Sepsis	23	26.4	25.6	23	30	34.1	76	28.7
Influenza	13	14.9	15.6	14	10	11.4	37	13.9
Pneumonia	1	1.1	1.1	1	3	3.4	5	1.9
RUC	50	57.5	57.8	52	45	51.1	147	55.5
Total patients	87	100.0	100.0	90	88	100.0	265	100.0

*See text for details of erythema and purpura.

TABLE 3 Clinical features of illness: 260 naval recruits with acute respiratory infection

Symptom or sign	Diagnosis						Total	
	Streptococcal infection		Influenza		RUC			
	N mber	Perce t	Number	Percent	Number	Percent	Number	Percent
Mal ise	66	86.8	33	89.2	103	70.1	202	77.7
Headache	51	67.1	23	62.2	62	42.2	136	52.3
Chilly sen ations	50	65.8	21	56.8	58	39.5	129	49.6
Myalgia	24	31.6	18	48.6	26	17.7	68	26.2
Arthralgia	6	7.9	2	5.4	2	1.4	10	3.8
Coryza or nasal congestion	38	50.0	23	62.2	108	73.5	169	65.0
Sore thro t	69	90.8	29	78.4	129	87.8	227	87.3
Tender cervical nodes	36	47.4	8	21.6	13	8.8	57	21.9
Dysphagi	38	50.0	0	0.0	4	2.7	42	16.2
Pharynge l ex date	54	71.1	2	5.4	6	4.1	62	23.8
Negative throat examination	10	13.2	27	72.9	93	63.3	130	50.0
Cough nonproductive	34	44.7	25	67.6	84	57.1	143	55.0
Che t pain or aching	0	0.0	7	18.9	3	2.0	10	3.8
Anorexia	17	22.4	5	13.5	30	20.4	52	20.0
Nausea and vomiting	2	2.6	0	0.0	4	2.7	6	2.3
Diarrhea	1	1.3	0	0.0	5	3.4	6	2.3
Total p tients	76	100.0	37	100.0	147	100.0	260	100.0

Reproduction of known cases

tococcal infections with the initial culture being negative and the subsequent cultures and rise in antistreptolysin O titers being obliterated by antibiotic therapy. The main defense of the criteria as listed above lies in the placebo group in which there were 0.3 log rises in antistreptolysin O titer in 58.6 per cent of the patients. Conversely some of the patients classified as influenza or streptococcal infections may have actually been suffering from other illnesses. The limitations in classification of respiratory infections lie largely in laboratory techniques for isolation of causative agents and measurement of immune responses. It is presumed that most of these infections were of viral cause inasmuch as known causative agents have not been demonstrated.

Clinical Features It was next of interest to determine if a retrospective analysis of the prominent clinical features of each of the types of respiratory infection would lend any information that would be helpful in differential diagnosis of similar cases in the future. In table 3 are shown the major systemic and local symptoms and signs in the three main groups. The five patients with pneumonia were excluded from this analysis as being too few to consider. In general it is evident that the presenting clinical picture was about the same in those illnesses classified as due to a bacterium, the streptococcus, or to the influenza virus, or those of unknown causes. The significant exceptions include the greater incidence of pharyngeal exudate, dysphagia, and tender cervical nodes in streptococcal infections, and the increased prevalence of nonproductive cough and substernal aching in influenzal infections. These data clearly indicate the problem in differential diagnosis of acute respiratory infections, and when coupled with the present day inadequacies of the laboratory, the problem becomes enormous in evaluating the therapy of these infections.

Most of these patients felt ill; a great majority of them complained of sore throat, and about two thirds had either coryza or nasal congestion. About half of the group complained of headache, chilly sensations, and a cough which was almost always nonproductive. Other signs and symptoms occurred with much less regularity. Gastrointestinal symptoms were especially rare.

The following calculations were made on the 189 patients thought to have had nonbacterial infections. The onset of the respiratory infection was rapid, with more than three fourths of the recruits seeking treatment within 48 hours of the onset of the first symptom (table 4). The three treatment groups were comparable in this respect. About half of the patients had initial temperatures between 100° and 101.9° F, and the remainder had oral temperatures in excess of 102° F. The leukocyte count

TABLE 4. *Selected observations and findings in 189 naval recruits with no bacterial respiratory infections*

Ob s e r v a t i o n	T r e a t m e n t g r o u p						Total	
	E r y t h r o m y c i n		P e n i c i l l i n		P l a c e b o			
	N u m b e r	P e r c e n t	N u m b e r	P e r c e n t	N u m b e r	P e r c e n t	N u m b e r	P e r c e n t
Onset < 24 hours	35	54.7	37	55.2	30	51.7	102	53.9
Onset 25-48 hours	19	29.7	17	25.4	17	29.3	53	28.0
Onset > 48 hours	10	15.6	13	19.4	11	18.9	34	18.0
Initial temperature < 100 F	1	1.6	0	0.0	1	1.7	2	1.1
Initial temperature 100-101.9	31	48.4	35	52.2	27	46.6	93	49.2
Initial temperature 102 or >	32	50.0	32	47.8	30	51.7	94	49.7
Initial WBC < 10 000	25	39.1	19	28.4	25	43.1	69	36.5
Initial WBC 10 000-11 900	15	23.4	16	23.9	10	17.2	41	21.7
Initial WBC 12 000-15 900	16	25.0	21	31.3	13	22.4	50	26.5
Initial WBC 16 000 or >	8	12.5	11	16.4	10	17.2	29	15.3
Total patients	64	100.0	67	100.0	58	100.0	189	100.0

Onset: Number of hours from first symptom to admission

was below 10 000 per cc in 37 percent of the patients, between 10 000 and 11 900 in 22 percent between 12 000 and 15 900 in 26 percent and over 16 000 in 15 percent of these patients

RESULTS OF TREATMENT

In spite of the fact that a tabulation of signs and symptoms revealed no differences from one diagnostic category to another or from one treatment group to another it was believed that an analysis of the results of the various therapies employed must be made separately for each type of infection This was done for each of the four categories as outlined above The patients with pneumonia were too few for any critical evaluation The two patients receiving antibiotics recovered uneventfully as did one of the three on placebos In the two other instances specific antibiotic therapy was instituted and these patients recovered promptly The patients with streptococcal infection were excluded because of the bacterial cause Parenthetically it may be stated here that the results of therapy of these patients were identical to those previously obtained in the treatment of similar infections by this unit Erythromycin and penicillin were equally effective in abbreviating the total duration of illness in eradicating the streptococcus from cultures of the throat and in shortening the duration of fever and leukocytosis in these patients

When these calculations were made for the other types of infection namely influenza and those of unknown cause the results were identical Because it was assumed that the illnesses had many clinical and laboratory similarities the separate results are not given here The detailed results which follow are the composite analysis for the group of 189 patients with presumptive nonbacterial infections Minor variations which occurred from one treatment group or one diagnostic group to another were not significant

Clinical Effects The persistence of each of the presenting symptoms was noted daily by the medical officer and recorded In general it may be said that there were no outstanding differences between those receiving either of the two antibiotics and those on placebos The symptom of sore throat for example persisted equally long in all three treatment groups By and large all patients were free of both local and systemic symptoms by the fourth hospital day Similarly the physical signs of the infection disappeared with equal regularity in all groups No secondary complications occurred in any patients

Duration of Fever The daily maximum oral temperature having been recorded fever was arbitrarily said to be present so long as the temperature did not maintain a sustained level below

99.5 F. Thus the duration of fever could be calculated for each patient. In figure 1 are shown the curves for each of the treatment groups. The duration of fever was virtually identical in all patients regardless of the treatment regimen employed. The apparent prolongation in the placebo group between the fourth and eighth days represents only one patient with pneumonia, and as such is not significant. Most of the patients were afebrile on the third hospital day, and this was usually accompanied by obvious evidence of clinical improvement as well. Neither erythromycin nor penicillin had any advantages over a placebo preparation as regards the duration of fever in these patients.

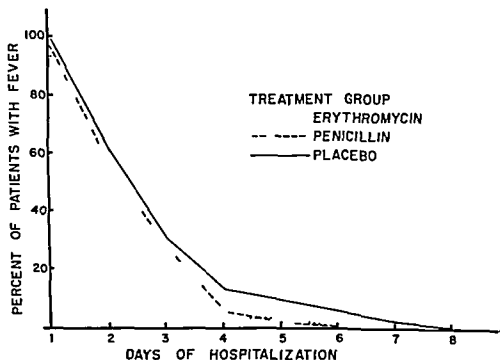


Figure 1 Duration of fever

Duration of Leukocytosis Similarly, the daily total leukocyte counts were tabulated, and leukocytosis was arbitrarily adjudged present as long as these counts were not persistently below 10,000 per cc. The duration of leukocytosis in each of the three treatment groups is plotted in figure 2. Although the penicillin group reflects a slightly greater number of patients with an initially elevated leukocyte count, for all intents and purposes the duration of leukocytosis was identical in each group. There was an abrupt decline in counts within the first 24 hours of hospitalization, and a steady and progressive decline thereafter. Only an occasional patient had leukocytosis persisting beyond the fourth hospital day. These findings generally paralleled the clinical improvement in the patient.

Total Duration of Illness Having established the time of onset of each respiratory infection as nearly as possible at the time of admission it was then feasible to calculate for each patient the total duration of the illness from the onset of the first symptom to the time when the patient appeared clinically well in respective of laboratory findings. Because most of the patients were seen within the first 48 hours of the onset and all patients were entered into one of the three treatment regimens immediately upon admission it would seem that this comparison is a valid

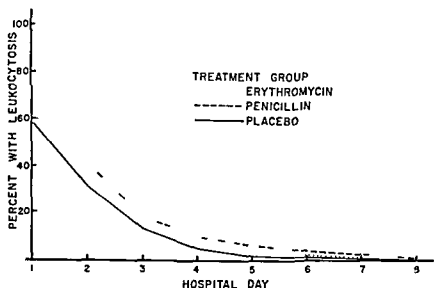


Fig. 2. Duration of Leukocytosis

one. In figure 3 are plotted the results of these observations. Although the duration of illness for the placebo group appears slightly longer than that for the erythromycin and penicillin groups the difference is not significant. By this criterion it cannot be stated that antibiotic therapy of these infections offers any advantages over a placebo.

Effect on Cultures for Group A Streptococci On admission to the infirmary about a third of the entire group of 265 patients had cultures of the nose and/or throat which yielded group A hemolytic streptococci. When the final diagnoses were established on the basis of all available information it was evident that in 14 patients or 5.3 percent of the total group the streptococci could not be causally related to the acute respiratory infection. The results of the daily nose and throat cultures were tabulated and the number of patients harboring group A streptococci was plotted for each day as shown in figure 4. Upon

institution of either erythromycin or penicillin therapy there was an abrupt decline in the number of positive cultures with few patients still yielding group A streptococci after the third hospital day. This effect was maintained for a few days subsequent to discontinuation of therapy, which generally occurred about the fifth day. At the time of the convalescent follow ups on about the fourteenth and twenty first days, a significant number of these patients again harbored streptococci. In contrast to the two antibiotic treated groups is the placebo group, in which there is a much slower but progressive decrease in the

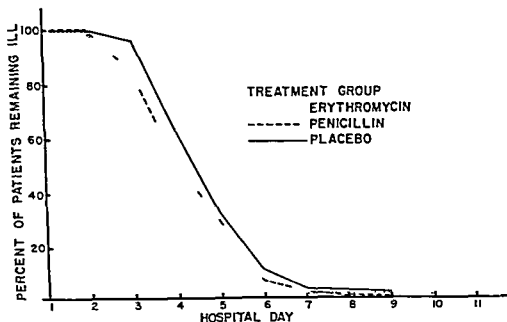


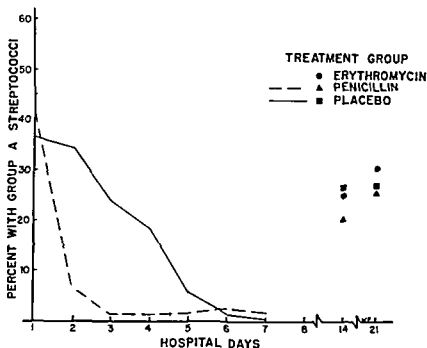
Figure 3 Duration of Illness

number of positive cultures approaching zero within seven days. At the follow ups, however, there is no essential difference between the three treatment groups as regards the number of positive cultures.

When the data were separately analyzed for the eradication of the streptococci not associated with clinical infection, the numbers in each group became so small that no valid comparison could be made. The effect on streptococci of the antibiotics and placebos given for nonbacterial respiratory infections can not be assessed from this study.

Untoward Reactions to Therapy The incidence of toxic reactions to any of the agents used in this study was extremely low. Only four patients showed any signs of reactions attributable to the treatment given. One patient receiving erythromycin complained of flatulence and loose bulky stools while on therapy.

another patient complained of similar symptoms developing the day after discharge from the infirmary and lasting only one day. One patient receiving penicillin intramuscularly developed a



Figur 4 P t g / pat t ha bor g gr p A t plococ i.

mild transient urticaria on the third hospital day. Another given the placebo preparation had a mild rash on the second day which subsided without specific therapy.

DISCUSSION

As each newly discovered antibiotic becomes more generally available, the increase in production and use makes the initially prohibitive cost decrease to the point that the antibiotic frequently becomes prescribed for nonspecific indications. With the possible exception of penicillin, it may safely be said that none of the antibiotics are yet so inexpensive that they may be indiscriminately used and abused. Apart from these purely economic reasons for the specific use of an antibiotic, there are many others of importance that should be considered by the physician who dispenses them so freely in this age of miracle drugs. Not the least among these reasons is the now considerable evidence of increasing resistance of many bacteria to many antibiotics.¹

Particularly in the acute respiratory infections of unknown cause, the physician, often at the specific request of the patient, has tended to abuse the antibiotics. Even the slightest mention in the medical literature of potential benefits has been reason sufficient to warrant a therapeutic trial of an expensive medication. To date there has been little convincing evidence that any of the antibiotics alter the course of any of the viral or related acute nonbacterial respiratory infections.⁷⁻¹¹ The present study was undertaken to determine the exact status of erythromycin in this regard, believing that only a well controlled and carefully documented observation would establish the value, or the lack thereof, of erythromycin in these infections. Adequate data are already available on the therapeutic efficacy of erythromycin in bacterial infections.²¹⁻²³⁻²⁵

The populations included in each of the three treatment groups were quite comparable as judged on many bases: medical history, clinical diagnoses, admission laboratory findings, mean age, and geographic origins. The majority of the infections from which these recruits suffered was probably viral in nature. The groups would appear to have been of sufficient size and comparability to warrant the detailed comparisons as presented above.

It is worth emphasizing that the therapeutic results were analyzed separately for each diagnostic category and, for simplicity and because of the identical analyses, the results were combined for presentation of the effect of therapy on the 189 nonbacterial infections. This similarity is not surprising; however, because these diseases, if not causatively the same, are at least similar, and it was shown that the differential diagnosis is nearly impossible on the basis of the presenting clinical features.

The persistence of the specific symptoms and signs associated with the infection was also not affected by the treatment regimen. This is not a new finding; either a critical review of the data of others demonstrates that the duration of local symptoms, for example, even in streptococcal infections, may be identical in those patients receiving either antibiotics or placebos.¹⁰ Perhaps the local tissue inflammatory response, once established, requires a certain minimum time for recovery, whether organisms remain present or not.

From the group of 189 patients with nonbacterial infections it may be concluded that the administration of erythromycin, penicillin, or a placebo to these patients did not alter the course of their respiratory infection when measured by the duration of fever, duration of leukocytosis, and the total duration of the

illness. It is possible of course that replicate experiments of this type might indicate that duration of fever and illness for a placebo group would always be slightly longer as seen in figures 1 and 3 in which case some small advantage might be attributed to antibiotic therapy of the infection. The present observations do not support such a contention however. When compared with earlier information on the use of penicillin aureomycin hydrochloride or oxytetracycline (terramycin) in similar infections⁷⁻¹¹ it is fair to conclude that these observations are the replication of the previous ones with the addition of data concerning erythromycin.

The sole advantage that may be attributed to antibiotic therapy is the effect on cultures for group A streptococci. As has been pointed out previously³ the use of either erythromycin or penicillin in sufficient dosage for adequate periods is successful in eradicating the streptococcus from cultures of patients with these infections. Continuation of therapy beyond three days is required only for bacteriologic cure which naturally decreases the likelihood of a relapse with reappearance of symptoms, complications or sequelae. The significantly high number of positive cultures in all groups at the convalescent follow ups would indicate that four to six days of erythromycin or penicillin therapy employing the dosages used in this study do little more than a placebo in maintaining patients consistently free of streptococci, an observation in agreement with the previous studies. The behavior of the placebo group as seen in figure 4 is a little surprising when compared with the earlier observations but it is likely that the numbers in the present groups are too small for such detailed comparisons.

The incidence of untoward reactions to the antibiotics and to the placebo tablets was remarkably low. Although antibiotic therapy would not be indicated in most of these infections still the present study of a large number of patients offers further proof on the relatively low toxicity of these agents. Either antibiotic may be used with impunity in the specific treatment of most patients with bacterial infections.

These present observations are generally in accord with those of others⁷⁻¹¹ who have studied the place of antibiotics in the treatment of viral and related infections.

SUMMARY AND CONCLUSIONS

To determine what effects erythromycin has on the course of respiratory infections a study of 265 male naval recruits with acute respiratory infections was made. Each patient was initially entered in strict rotation into one of three treatment regimens: erythromycin, penicillin or a placebo. Detailed clinical bac-

terologic virologic, and serologic information was obtained on each patient. Final diagnoses were established on the basis of all available information, and it was determined that the majority of the patients were suffering from viral or related nonbacterial respiratory infections of unknown cause. The populations in each treatment group were shown to be comparable on many scores.

Separate analyses of the therapeutic effects of the three regimens were made for each diagnostic category. The generally beneficial effects of erythromycin and penicillin in streptococcal infections were similar to previous observations. In the nonbacterial respiratory infections, detailed observations were reported on the clinical effects, the duration of fever, the duration of leukocytosis, the duration of the illness, and untoward reactions to the agents given. The administration of either of the antibiotics, when compared with the course in the placebo group, did not alter the course of the infection. In essence, then, it may be concluded that erythromycin and penicillin were specifically indicated for treatment of the streptococcal infections only. No secondary complications were encountered in any group.

It appears that the routine use of erythromycin or penicillin in the treatment of viral or related nonbacterial respiratory infections is of little or no value in affecting the acute infection, and for economic and medical reasons should be avoided.

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HIGH VELOCITY MISSILE WOUNDS

With Particular Reference to the Head

ELDRIDGE CAMPBELL M. D.

IN war the most important function of the surgeon is the treatment and care of the wounded. Today, however, all civilized peoples are surfeited with war service in the armed forces. It is sometimes considered an inescapable duty rather than a privilege. By contrast, all about us are exciting new developments in what we think of as "civilian surgery": the cure of aneurysms of the circle of Willis and of the aorta, new operations for the control of pain, new concepts of the roles of the adrenal and the pituitary glands in surgical convalescence, and many more. Let us not forget, however, that military surgery often has been in the past, and can yet be, a most fertile and useful field of study. What we learn of the body's reaction to injury may be applied to all forms of surgery: the biology of wound healing is fundamental to all operations. As Henri de Mondeville so clearly perceived and stated more than 600 years ago: "Nature is a fiddle player to whose tunes the surgeon must learn to dance."

Wounds may be considered from two standpoints: (1) the local lesion and (2) the pathophysiologic changes attendant thereto. Such a division is largely a matter of convenience because the two are interdependent. The following discussion will be limited to a few of the mechanical aspects of wounding by missiles.

For many years both hunters and military surgeons have been intrigued by certain aspects of the high powered rifle bullet wound. The aperture of entrance is often small, while that of exit is relatively large; tissue damage along the path is proportionately even greater; air may be found within the wound, requiring differentiation from gas due to anaerobic bacteria, and, most puzzling of all, structures not directly in the path of the missile, such as arteries, nerves, or even bone, may be injured.

All these features have been observed in head wounds. In the brain one may observe along the track of the missile a zone of pulping and hemorrhage, normal tissue well beyond, and, in be

F m b D partm t f Surgery Albany Medical College Albany N Y
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1953



Figure 1 P for a g w o n d, S u r i l t i m e 30 m u t Figure 2 P for a g w o n d, S u r i l t i m e 13 h u r (R p r o d u c d w i t h p e r m i t ³)

tween the very significant area referred to by Rand and Rand and Courville³ as the zone of delayed disintegration (figs 1 3)

Three types of fracture are encountered in the skull (1) the very common penetrating (or blow in) fracture with depressed or



Figure 3 P for a g u n d, S u r i l t i m 31 h o u r N t the l d i g o n e f d l a y d d i t g r a t i o n. (R p r o d u c d w i t h p e r m i t t i o n)

indriven fragments, (2) the linear fracture usually emanating from the former openings, and (3) a curious type of fracture which is largely confined to the base, which is not continuous with wounds of entrance or exit, and which Campbell and Kuhlbeck³ termed "discontinuous" fractures (fig 4)

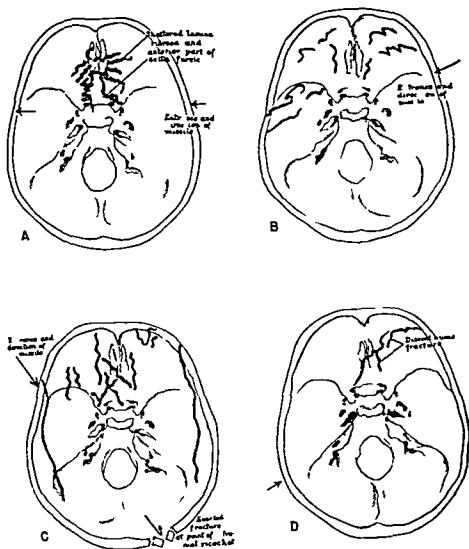


Figure 4. Discontinuous fractures in base of skull, as drawn at autopsy (Reproduced with permission³)

In this connection the following extract from the autopsy record of President Lincoln is a pertinent illustration of a "discontinuous" fracture

There was a gunshot wound of the head around which the scalp was greatly thickened by haemorrhage into its tissues. The ball entered through the occipital bone about an inch to the left of the median line and just above the left lateral sinus which is opened. It then penetrated the dura mater, passed through the left lateral ventricle and

lodged in the white matter of the cerebrum just above the anterior portion of the left corpus striatum where it was found. The wound in the occipital bone was quite smooth, circular in shape with beveled edges, the opening through the internal table being larger than that through the external table. The track of the ball was full of clotted blood and contained several little fragments of bone with a small piece of the ball near its external orifice. The brain around the track was pale, taceous and livid from capillary haemorrhage into its substance. The ventricles of the brain were full of clotted blood. A thick clot beneath the dura mater coated the right cerebral lobe. There was a smaller clot under the dura mater of the left side. But little blood was found at the base of the brain. Both the orbital plates of the frontal bo-

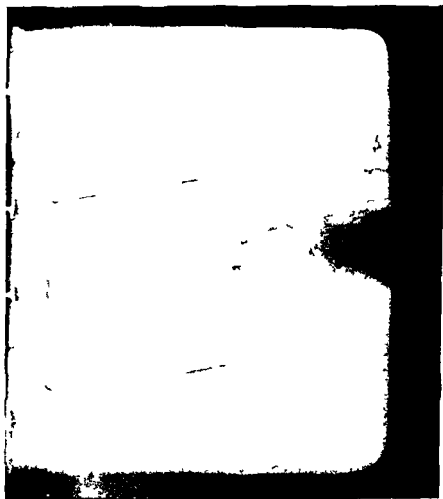


Figure 5 Microscopic section of bone showing cavity forming behind
45-caliber pistol bullet. G.I.T. model (Courtesy of Chemical Corp.
Medical Laboratories, Army Chemical Center, Md.)

were fractured and the fragments pushed up towards the brain. The dura mater over these fractures was uninjured [italics mine]. The orbits were gorged with blood.

WOUND BALLISTICS

In order to comprehend either the gross or the microscopic changes in wounded tissues, a knowledge of wound ballistics is essential. One must study not only the behavior of the missile in tissues of various densities and strengths but also the types of displacement, shearing, and distraction which may result.

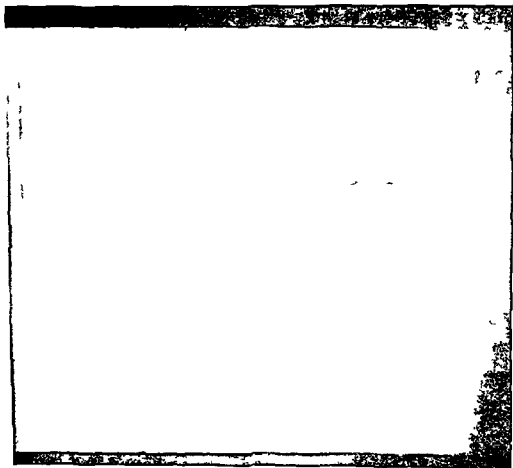
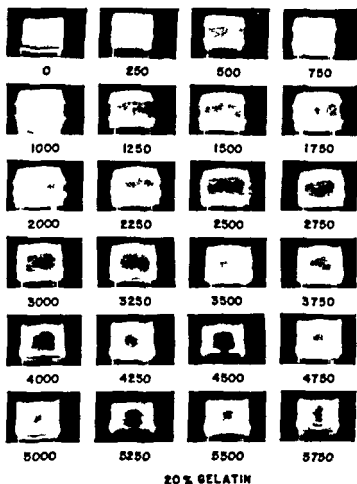


Figure 6 Microcond roentgenogram showing 45-caliber bullet passing through heart and lungs of a dead animal. Lungs suffused with lipiodol to increase contrast. Note the large cavity in the heart and the smaller cavity in the less dense lungs. (Courtesy of Chemical Corps Medical Laboratories Army Chemical Center Md.)

In recent years the development of spectrophotography has made it possible to make roentgenograms of missiles with about one millionth of a second (microsecond) exposure time at the rate of 8 000 per second. Thus one is able to follow a high velocity missile in its flight through living tissues. A number of such studies have been made, one of the most important being

that of Harvey² and his associates Missiles in flight with velocities of from 800 to 900 ft./sec corresponding to the .45 caliber revolver of from 1 100 to 1 400, corresponding to the .29 caliber long rifle of 2 800 ft./sec, corresponding to the M 1 rifle and others up to 5 000 ft./sec, as are encountered in some heavy bomb fragments have been observed by this method

The rather startling revelations concerning the local mechanical changes in traversed tissues as illustrated below can best be understood if one bears in mind the formula $F = \frac{1}{2} M V^2$ where F is the force expended M is mass and V the velocity Thus



20% GELATIN

Figur 7 Series of micro and roentgenograms showing the development of cavitation in a gelatin model following passage of a 30-caliber bullet. The number below each roentgenogram is the time in milliseconds of a high speed impact. Not the result of a collapse or plateau of the cavity (Courtesy of Chemical Corps Medical Laboratories Army Chemical Center Md.)

the wounding force is directly proportional to the mass of the missile, but to the *square* of its velocity

A slowly moving object, such as a nearly spent bullet or a bayonet destroys tissue in its immediate path and pushes those adjacent thereto aside without great damage. Not so with missiles of high velocity. Here one sees evidence of tissues thrust aside with such astonishing violence as to produce an actual cavity



Figure 8 Microsecond roentgenogram showing wound cavitation in goat's leg following passage of 30-caliber bullet (Courtesy of Chemical Corps Medical Laboratories Army Chemical Center Md.)

With increasing velocities these cavities become larger, recalling again the fact that force is proportional to the square of the velocity

Figure 5 shows the formation of the cavity in a gelatin block behind a .45 caliber bullet. Even at this relatively low speed (850 ft/sec), the cavity is much wider than the missile. Figure 6 shows the cavity produced by a similar missile traversing a

dog's thorax. The cavity in the heart is much larger than that in the relatively less dense lung. Rapid variation in size and shape of a cavity (pulsation) may be conveniently examined in a series of spectrophotographs (fig 7) caused by a 30-caliber bullet (traveling with a velocity of about 2,800 ft/sec) in a gelatin block. The cavity is almost collapsed within about 0.06 second. The closure of the apertures of entrance and of exit prior to the collapse of the cavity accounts for the trapping of air within wounds. As the velocity is increased the size of the cavity and hence the cross sectional area of tissue destruction mounts rapidly. Figure 8 shows the wake of a 30-caliber bullet in a goat's thigh. Thus the stretching and tearing of blood vessels and nerves at a distance from the actual path of the missile

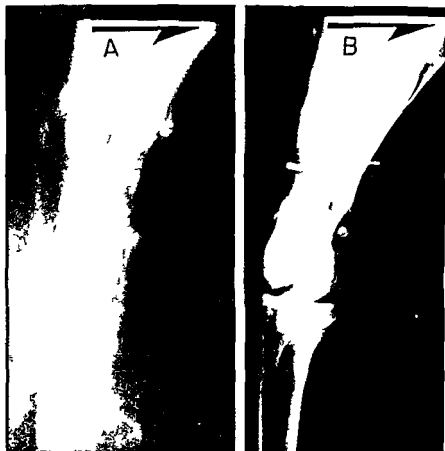


Figure 9 Microphotographs of goat's leg hit by a 30-caliber bullet. (A) shows maximum size of wound cavity with residual cavity (B). The cavity in B has been filled with lipiodol. Note the undisturbed structure of the femur which has taken place despite the fact that the bullet did not touch the bone. (Courtesy of Chemistry of Chemicals and Medical Laboratories, Army Chemical Center, Md.)

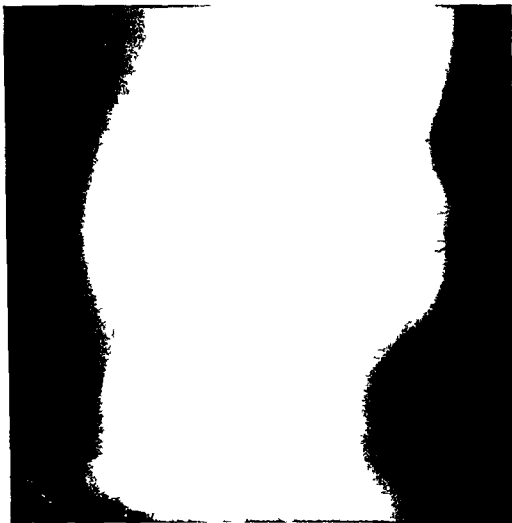


Figure 10 Microsecond roentgenogram showing wound cavity created by a 22 caliber long-rifle soft nosed bullet. Although this missile was lighter and slower than those shown in figures 8 and 9 the temporary wound cavities are about equal, thus demonstrating the increase in wounding as the result of mushrooming and fragmenting. (Courtesy of Chemical Corps Medical Laboratories Army Chemical Center Md.)

become understandable. In figure 9 (A and B) may be seen, first, the huge cavity immediately following the passage of a 2,800-ft/sec bullet and, second, the extensive comminution of the femur which resulted despite the fact that it was not touched by the missile. The relatively small permanent cavity is outlined with lipiodol, whereas the area of tissue destruction extends over a far wider zone.

Additional factors of practical importance referable to the missile are fragmentation, tumbling, and yawing. A soft missile, such as one of lead, often mushrooms and/or breaks into a number of separate particles, each of which creates a path of destruction of its own. This is particularly true within the skull where in

dog's thorax. The cavity in the heart the relatively less dense lung. Rapid of a cavity (pulsation) may be a series of spectrophotographs (fig. 1) of a bullet (traveling with a velocity of 1,000 ft. per second) passing through a gelatin block. The cavity is almost closed prior to the collapse of the cavity in the air within wounds. As the velocity of the cavity and hence the cross sectional area mounts rapidly. Figure 8 shows the wound in a goat's thigh. Thus the stretchers and nerves at a distance from the



Figure 9. Micrograph of a gelatin block showing the path of a bullet. (A) The cavity in the gelatin block. (B) The cavity in the bone. (Courtesy of Army Chemical Center, Md.)

doric that, in glancing blows, the maximum or only depression may be confined to a displaced fragment of the inner table

The mechanism of the production of the "discontinuous" fracture is unknown. The most plausible explanation, however, is

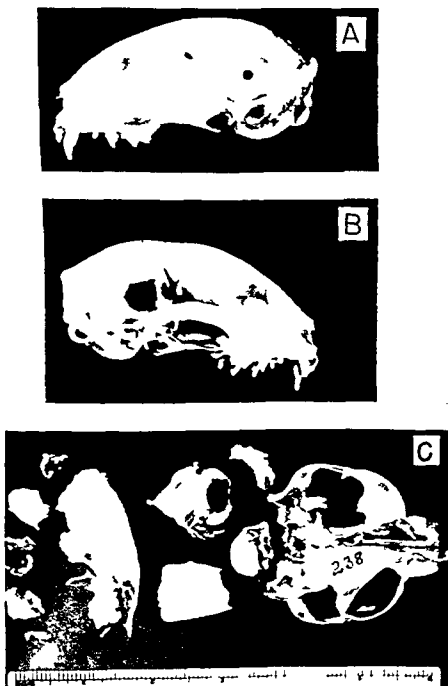


Figure 12. Relative effects of a missile on the skull of a cat with and without removal of the brain before the shot. (Reproduced with permission¹)

based on the concept of waves of deformity in the skull so clearly demonstrated by the stresscoat studies of Gurdjian and his co-workers ¹³

It has been postulated by others however that this represents a bursting injury comparable to that depicted in figure 12. Although the intracranial pressure is doubtless enormous at the instant of missile penetration and squeezing or thrusting injuries at the foramen magnum or incisura might be expected to result

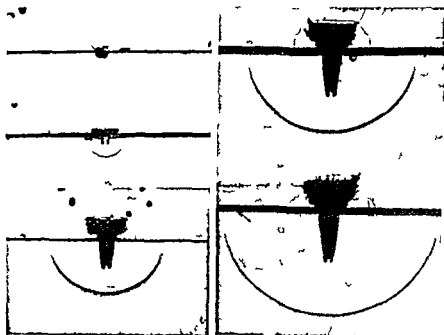


Figure 13 Spark shadowgraphs of a 4/32-in. bullet taken at intervals of 1/1000 sec. after impact. The bullet was fired at a velocity of 4800 ft./sec. (Reproduced with permission)

these have not been commonly observed. Furthermore, an explosive force from within the skull would be expected to thrust comminuted fragments outward. That this is not uniformly the case is attested by the autopsy record of President Lincoln, in which the orbital plates were clearly recorded as having been pushed up towards the brain.

Pressure changes within the cranium at the instant of wounding must nevertheless be very great. These come about as the result of three separate and distinct factors: the concussion waves, the deformity of the skull, and the missile tract cavity. All exert their effects within a few thousandths of the first second and probably to some extent overlap.

Harvey⁵ and his associates found that shock waves were generated at the point of the bullet's impact, and that they passed through tissues at the rate of sound through water (about 4,800 ft./sec) (fig 13). They displace brain tissue very little where it is not in contact with gas, and are probably not of themselves highly injurious.

The changes in intracranial pressure at various points within the skull at the time of fracture have been recorded by Gurdjian.¹⁰

* * * pressures of the order of 2 500 to 5 000 mm of mercury or 50 to 100 pounds per square inch are recorded in association with concussive effects. Later work has shown that the shorter the duration of energy, the less the clinical effect. * Twenty-two pounds per square inch will cause a fatal concussion if the pressure lasts in the neighborhood of 1/30 of a second, but 60 pounds per square inch lasting 1/1000 of a second will cause minimal concussive effect with a short period of apnea and very slight increase in blood pressure. It appears therefore that the time duration of the sudden rise in intracranial pressure either from a deformation of the skull or an acceleration of the head or a combination of both is the cause of the clinical effects of concussion. * *

INTRACRANIAL PRESSURE CHANGES

The pressure elevation associated with the formation of missile cavities must be enormous, particularly in perforating wounds. Exact figures are not available for publication.

How does the brain tolerate these tremendous pressure changes? Why not a fatality in every fracture or missile wound? The answer must be that the brain can tolerate far higher pressures than formerly believed possible—*provided* they are of very brief duration, and provided also that they are not associated with extensive missile-path destruction and shearing. If the skull were as elastic as the skin, each severe wound would probably cause such distortion as to prove instantly fatal.

Evans and his co-workers¹¹ at Cincinnati and we at the Albany Medical College have often recorded cerebrospinal fluid pressures which mounted to 800 or 1,000 mm of water during induction of anesthesia, without evidence of permanent ill effects. It is the belief of Evans that from the clinical standpoint displacement and distortion are of more importance than pressure *per se*. Incidentally, it is worth recalling that peripheral nerves can function under very high pressures—provided no distortion is present. Mitchell¹² observed that the rabbit's sciatic nerve could conduct impulses for as long as two minutes when subjected to pressures up to 50.8 cm of mercury. This work was subsequently confirmed and amplified by Denny Brown and

Brenner¹³ Grundfest actually demonstrated that frog nerve would conduct when subjected to pressures up to 1 000 atmospheres provided the oil in the pressure chamber was oxygenated

A study of the intracerebral missile tracts is of major importance to the surgeon Each may conveniently be considered in three parts the zone of pulping and blood clots the zone of delayed disintegration and the surrounding normal brain tissue The path of pulping from the primary (and to a certain extent from secondary) missiles is wider than the moving fragment itself The speed tumbling and yawing of the missile as well as the number type and size of wounded blood vessels are the principal determining factors Because of the elasticity of the skin wounds of entrance and exit are proportionately smaller

The zone of delayed disintegration includes neighboring nerve tissue which has been mortally injured by compression, distortion and shearing but which has not been pulped When seen within the first hours its macroscopic differentiation is difficult but as time goes on a softening of its texture and a gray brown appearance serves to delineate it Thus in figures 1 2 and 3 the relative width of delayed softening can in rough measure be demonstrated about missile tracts of 30 minute (fig 1) 13 hour (fig 2) and 31 hour duration (fig 3)

In the strictest sense it is obviously impossible at the time of operative débridement to remove all of the pulped tissue much less all of the zone of delayed disintegration However it is likely that the earlier the pulped tissue and blood clot are removed and also indriven bone fragments and any missiles which can be reached safely and conveniently the less will be the local and distant effects of pressure the more tissue in the areas of reversible damage will recover and the earlier will correctable disturbances of function be favorably altered

SUMMARY AND CONCLUSIONS

Energy released in tissues by a high velocity missile results in mechanical alterations of two main types Shock waves which precede the missile result in little distortion and are believed to do little harm The cavity which follows, however results in great distortions stretchings and shearings many of which occur at a considerable distance from the actual missile tract

In planning the débridement of such a wound whether it be in the head or elsewhere it thus becomes evident that adequate exposure will usually entail a far more generous incision than the size of the wound of entrance or of exit might suggest

Studies of the pressure changes during the various phases of the formation of these cavities would appear highly desirable

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THE ONE INDISPENSABLE ELEMENT

I fear that in the presence of the machines and the amazing devices which science has developed to extend the capabilities of men we sometimes overlook the fact that man himself is the one indispensable element of victory in war. It is the ground soldier who must seize and hold the terrain necessary for victory. There is a particular pride that comes from service in our ground forces service that demands the highest quality of personal leadership the maximum of individual know-how and the greatest courage. In this age as in all ages the power of decision remains in the hands of men who can live and fight under the most adverse conditions tough combat soldiers who can come to grips with the enemy and exercise direct and effective compulsion upon him.

—HONORABLE ROBERT T. STEVENS

Secretary of the Army

Addressed at Commencement Exercises

United States Military Academy June 8, 1954

TREATMENT OF BACTERIAL INFECTIONS OF THE SKIN WITH ERYTHROMYCIN NEOMYCIN OINTMENT

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JOHN A HUNT *C pta n, USAF (MC)*

JAMES F HILDERBRAND *C pta USAF (MC)*

CUTANEOUS diseases constitute a major cause of hospitalization and noneffectiveness in the U S Air Force. Latest statistical data (1951) shows that dermatological conditions (excluding dermatophytosis) were the fourth leading cause of time lost from duty and third highest as the cause of hospital admission. These data showed that pyogenic infections of the skin constitute from 30 to 40 percent of all skin diseases treated in military hospitals.

The misapplication of antibiotics and other measures used to treat infections has been contributory to this situation. This is not meant as an indictment of conscientious and well meaning medical officers. As Kierland pointed out, this is rather an indictment of lack of dermatological training in medical schools throughout the United States, lack of sufficient provisions for training the general military medical officer in dermatology, and a general military medical unawareness of the seriousness of dermatological conditions as a cause of noneffectiveness. Regardless of reasons, the dermatologist's contribution to lowering non-effective rates is not granted the military medical recognition to which it is entitled. Provisions for dermatological facilities are rarely made when new hospital construction is contemplated. In many instances, the military dermatologist is charged with the care of patients with gonorrhea, while those with acute pyogenic infections of the skin, cutaneous cancer, hemangiomas, atopic dermatitis, and other cutaneous diseases are often handled unwisely by specialists in other fields and general medical officers. The correction of these conditions should become a matter of education, starting in medical schools and continuing through the career of our military personnel.

Because of the alarming statistics on causes of noneffectiveness as mentioned above, and the high rate of pyogenic infec-

tions of the skin, we thought it appropriate to review and present our concepts of recent advances in the treatment of such conditions, as applied to military dermatological problems. As we had just completed a study of the effectiveness of a combination of erythromycin and neomycin in the treatment of bacterial infections of the skin, these results will also be given.

ANTIBIOTICS AND THEIR EFFECTIVENESS

In the past few years, many antibiotics for oral, parenteral, and topical use have become available for the treatment of bacterial infections. Most have been adopted for use by the average physician on a trial basis with the thought that if this one doesn't work the next new one will. This attitude has stimulated the major biological houses and research workers to search for antibiotics with broader spectra. To date, no single antibiotic has a broad enough spectrum to be effective against all bacteria. It has been shown by Livingood and associates¹ and Kile and co-workers² that neomycin has the broadest spectrum of any other single antibiotic and is more effective in treating most skin infections than any other topical agent. Neomycin is derived from strain of *Streptomyces fradiae*. It has a low sensitizing index, and is extremely soluble and stable in solution. This characteristic makes it ideal for use as a compress as well as in ointment form. However, neomycin is inferior to aureomycin and oxytetracycline (terramycin) when used for hemolytic streptococcal infections. Table 1 is adapted from one first published by Livingood and Mullins³ and includes additional findings relative to erythromycin by Haight and Finland⁴ to show the relative in vitro and in vivo effectiveness of the various available antibiotics recommended for the local treatment of bacterial infections of the skin. It can be seen that neomycin has the broadest spectrum except for its action against hemolytic streptococci.

More recently, combinations of single antibiotics have been developed in an effort to broaden the spectrum of one or the other. With the discovery of erythromycin, derived from *Streptomyces erythreus*, we had available an antibiotic with major activity against all gram positive cocci. Haight and Finland showed that erythromycin is most active against gram-positive cocci as well as strains of *Neisseria diphteria* bacilli, and *hemophilus* but relatively inactive against most coli and enteric bacilli. They found that the most sensitive organisms were pneumococci and group A hemolytic streptococci. This activity made it theoretically ideal for combination with neomycin. The results of the clinical effectiveness of this combination will be shown later.

One may ask why penicillin has been more or less ignored in the modern treatment of pyogenic skin infections. We believe that most bacterial infections of the skin can be favorably in

TABLE 1 Antibacterial spectrum of antibiotics in vitro

Antibiotic	Hemolytic staphylococcus (coagulase- positive)	Hemolytic streptococcus	Penicillin	Polymyxin	Other gram negative bacilli
Aureomycin	++	++	0 (?)	0 (?)	++
Bactracin	++	+++	0	0	0
Neomycin	+	++	++	+++	+++
Polymyxin B	0	0	+	++	?
Oxytetracycline	+++	+	0 (?)	++	+++
Erythromycin	++	++++	0 (?)	0 (?)	0 (?)
Lactidol and Mullinase	+++	Sup	+ Sensitive	II	0 N H t
Highly and Falsely	++	E II t			

fluenced by proper local treatment in about the same time as required for penicillin when used parenterally. In addition, penicillin is inactive against the gram-negative organisms, including *Pseudomonas proteus* and others. We believe, however, that penicillin is the antibiotic of choice for parenteral administration and should be used along with proper local treatment in fulminating infections with lymphangitis as well as generalized infectious diseases. The danger of using penicillin locally will be outlined below.

The ideal antibiotic for local use should fit certain stringent criteria:

- 1 It should have a low allergenic and irritative index.
- 2 It should have a broad spectrum for both gram positive and gram negative organisms.
- 3 It should not promote the growth of *Candida albicans* (*Monilia albicans*) but, rather, contain a moniliostatic agent.

ALLERGENICITY

All drugs used on animals and human beings have the potentiality of sensitizing the patient or causing primary irritation. This factor contributes to about 10 percent of military causes of noneffectiveness. Antibiotics and other drugs used to treat skin conditions vary widely in their sensitizing potentials. In our experience, the following drugs, especially when used for long periods, are apt to sensitize or irritate the patient:

Nitrofurán compounds The allergic contact dermatitis caused by these drugs is of a particularly severe and resistant nature. We have seen contact dermatitis occur with these drugs in as short a period as 20 days. We believe that the use of these drugs for their antibacterial properties is unjustified because of their low bactericidal properties, as compared to the relatively "safe" antibiotic ointments that are available.

Mercury compounds Mercury produces sensitivity in upward of five percent of patients. Hu and associates⁷ have shown in their work on tissue cultures that drugs causing irritation in low concentration are more apt to sensitize than bland preparations.

When used locally *sulfonamide compounds*, *penicillin ointment* and *streptomycin* (not made in ointment form by any commercial companies) are apt to sensitize as well as produce other undesirable effects. Ointments containing sulfonamide compounds, for example, may cause a decrease of the "light" threshold of the patient with severe sunburn or other photodermatoses, if exposed to roentgen rays or ultraviolet while they are using it.

Antihistamines Antihistaminic ointments produce allergic reactions in certain instances. The relationship of antihistamines to local anesthetics follows their potentiality in producing allergic reactions. Such drugs used in ointment form are apt to sensitize. We do not imply that these preparations should never be used but care should be exercised when used on an inflamed or otherwise broken skin.

It is apparent that a great number of the above mentioned preparations are used on dermatological patients by the general medical officer. Often he is not aware of the development of sensitivity as reflected by an exacerbation of the lesion or failure to get well. Withdrawal of the offending drug may result in recovery of the patient. Caution in the use of these drugs will surely be followed by a decrease in the noneffectiveness of patients with dermatological conditions. All the antibiotics listed in table 1 can be used with assurance of their low allergenicity. Occasionally a patient may develop sensitivity to one or the other of these preparations (the antibiotic or the ointment base) but its occurrence will be rare.

BROADNESS OF SPECTRUM

Table 1 shows the variation in effectiveness of the various antibiotics for the bacteria responsible for most pyogenic infections of the skin. Theoretically an antibiotic or combination of antibiotics effective against all bacteria would enable us to treat pyogenic skin infections successfully without determining the organism or organisms causing the infection. Unfortunately facilities for accurate determination of offending organisms are not possible at most of our military hospitals. Moreover if we have an antibiotic with a particularly broad spectrum for both gram positive and gram negative organisms our necessity for culturing is decreased in most instances. Of the antibiotics listed in table 1 neomycin shows the broadest spectrum with excellent activity against hemolytic staphylococcus (found in over 65 percent of pyogenic skin infections) satisfactory to excellent activity against hemolytic streptococcus and excellent activity against the gram negative organisms. Its only deficiency (and that is slight) is its low activity against hemolytic streptococci as compared to aureomycin, oxytetracycline and bacitracin. However these latter drugs are less effective against the gram negative organisms and hemolytic staphylococci when compared with neomycin.

MONILIALSTASIS

The widespread use of the antibiotic ointments brought reports of moniliasis developing as a complication. This complication is manifested by an increase in redness and irritation

of the treated part as well as development of a frank moniliasis which often proved as stubborn as the original infection. Moniliasis is most apt to develop in the genitocrural areas and other intertriginous sites, but it has been observed elsewhere. Although the production of moniliasis from the use of antibiotic ointments is rare, efforts have been made by pharmaceutical companies to reduce this risk still further by the use of the parabens incorporated into the ointment bases. Methyl p-Hydroxybenzoate (methylparaben) is moniliostatic and does not interfere with the action of the drug. Although moniliasis is a complication of local antibiotic therapy, it is mentioned only to create awareness of the possibility. This occasional occurrence in no way contraindicates the use of such antibiotic ointments.

With the discovery of erythromycin, immediate consideration was given to its possible use in combination with another antibiotic. Neomycin was considered the best single antibiotic available except for its relative deficiency against hemolytic streptococci. The high activity of erythromycin against hemolytic streptococci (table 1) would theoretically make it ideal for combination with neomycin. This combination (erythromycin-neomycin ointment) supplied to us by the manufacturer in sufficient quantities to conduct a large clinical trial, contained 5 mg per 1 gram of erythromycin and neomycin in a suitable base.

PROCEDURE

The use of this combination was limited to certain primary and secondary pyogenic infections of the skin as shown in the classification in table 2. At the time of the first visit the diagnosis was made and the patient given a tube of the ointment. Patients were instructed to gently rub the ointment into the lesion for about 30 seconds four times daily. In cases of impetigo contagiosa the instructions also included removal of the crusts before application of the ointment. Patients were instructed to return at weekly intervals for evaluation and change of treatment if necessary. It should be noted that standard methods of management with soaks and compresses were not generally prescribed. This procedure is unnecessary in most cases and should be reserved for those patients with excessive weeping or to remove crusts to allow the antibiotic to contact the part. A total of 141 patients were treated with erythromycin-neomycin ointment. Results of this treatment are shown in table 2.

RESULTS

Of 92 patients suffering from one of the primary bacterial diseases of the skin, 81 were cured and 11 were improved. No patient remained the same or became worse. The results in patients having pyogenic skin disease secondary to other diseases was not

TABLE 2 R I t t m t o p y g k / t w t h r y t h m y n m y t m e t

T y p e t		N u m b e r	C u r d	I m p	U n i m p e r d
I m r y	S e c o d r y				
I m p e t a g s a		28	26	2	0
I p g u s d		28	26	2	0
S y u l g		17	14	3	0
P u l l i l		14	10	4	0
O		3	3	0	0
F u r u n l		2	2	0	0
T l		92	81	11	0
	C t a d m	16	10	4	0
	F m u d m a	9	8	1	0
	S b o h d m	6	5	1	0
	S u r g l p d u r	4	4	0	0
	B u r	2	2	0	0
	I b	2	2	0	0
	I g o	2	2	0	0
	D m a p h y m	2	2	0	0
	N m m u l	2	0	0	2
	D m a p	1	0	0	1
	I g u l m a	1	0	1	0
	A p d m a	2	1	0	1
T l		49	36	7	6
G d l		141	11	18	6

as good, with 36 of 49 being cured 7 improved and 6 remaining the same or becoming worse under treatment. It can be seen (from a study of table 2) that best results were obtained in the treatment of impetigo contagiosa and impetiginous dermatitis. We were favorably impressed, also, with the results of treatment of sycosis vulgaris. However most of these were the superficial rather than the deep boggy resistant type.

TABLE 3 *Average time to cure cutaneous bacterial infections with erythromycin-neomycin ointment*

Infection	Number of patients cured	Average number of days required
Secondary pyogenic infections	36	7.64
Impetigo contagiosa	26	5.58
Impetiginous dermatitis	26	10.69
Sycosis vulgaris	14	19.71
Folliculitis	10	9.40
Otitis externa	3	8.66
Furunculosis	2	7.00

Table 3 shows the average time required to cure patients with pyogenic skin diseases. Patients with impetigo were cured in an average of 5.6 days while those with sycosis vulgaris took an average of over 19 days. It has been our experience that the time required for cure in these conditions compares favorably with that when other antibiotics and other measures are used.

COMPLICATIONS

The unimproved patients were cases of pyogenic skin infections complicating other conditions. Three patients with definite deleterious reactions to the application of erythromycin-neomycin ointment are briefly reported.

Case 1 This patient, a foreign cadet, had a secondary infectious dermatitis of the groin following the injudicious use of podophyllum in the treatment of condyloma acuminatum. The infection cleared in about seven days but the patient, because of the language difficulty, misunderstood instructions. He continued the use of the ointment we had prescribed for 21 days and by that time he had developed severe moniliasis.

Case 2 This patient with folliculitis of the inguinal region developed increased weeping and irritation after using erythromycin-neomycin ointment for seven days.

Case 3 This patient was treated for a secondarily infected contact dermatitis of the penis. After using erythromycin-neomycin ointment for three days he noticed increased irritation and inflammation.

It should be noted that these three patients all had involvement of the inguinal or genital region. Only the first case could be attributed to the development of moniliasis. The other two cases appeared to be of the intolerance type. In a series of 184 patients treated with erythromycin alone Livingood and associates reported exacerbations of skin lesions as a result of the antibiotic in three (1.6 percent). Although patch tests were not done in our series of 141 patients only two (1.4 percent) exacerbations could be attributed to either the erythromycin or neomycin. The third patient (0.7 percent) developed moniliasis following continued application of the ointment.

DISCUSSION

The successful treatment of patients with pyogenic skin infections demands a recognition of the disease, the avoidance of preparations liable to sensitize or irritate, and the local application of broad spectrum antibiotic ointments. It is our opinion that penicillin given parenterally is the antibiotic of choice in the event of systemic involvement. However aureomycin and oxytetracycline may be used orally in such cases. From theoretical considerations neomycin is probably the antibiotic of choice for the treatment of most pyogenic skin infections. Although the erythromycin-neomycin combination yielded excellent clinical results its great superiority over neomycin alone was not apparent to us. The only possible criticism of erythromycin-neomycin ointment is the potentiality of erythromycin to produce irritative effects when used locally (1.4 percent in our series). The exact allergenic and irritative possibilities of this antibiotic must await further analysis.

SUMMARY AND CONCLUSIONS

Reduction of noneffectiveness of military personnel resulting from the pyogenic diseases of the skin can be accomplished by (1) early recognition of the disease process, (2) application of the proper antibiotic ointment, (3) avoidance of the use of irritating and allergenic substances, and (4) the judicious use of parenteral penicillin when indicated.

All medical officers on general duty should be indoctrinated in the recognition and proper management of common diseases of the skin.

We considered our results with erythromycin-neomycin ointment in the treatment of patients with primary skin infections ex-

cellent to superior, and in those with secondary skin infections, good to excellent.

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ON REASSURANCE

A great many doctors are so afraid that their own emotions may be aroused by their patients either out of sympathy or dislike or even amorosness that they don't give them a chance to get a word in edge wise. They talk at and down to them to protect themselves and as they think mistakenly to save time. Before they know what to reassure them about they will begin to reassure them in a premature Pollyanna sort of way. A patient complaining of the symptoms of an ulcer may not be at all reassured when he is told that x ray does not show any deformity of the duodenal cap. He may actually be galled by his domineering aggressive wife or his unreasonable boss and may want to talk about that. But the doctor's insistent and prompt reassurance may shut him up completely. Reassurance in the face of any considerable anxiety is at best a temporary and superficial expedient and needs like digitalis in a failing heart to be constantly repeated. The most reassuring thing is the quiet firm integrity of the physician his devotion to his job and his scrupulous thoroughness.

—CARL BINGER M D

In Journal of the Medical Association of the
State of Alabama p 223 Mar 1954

MORTALITY FACTORS IN ACUTE SMALL BOWEL OBSTRUCTION

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ACUTE small bowel obstruction continues to be a serious problem but the mortality has decreased because of better diagnosis and improved management. Although antibiotics and electrolyte management have played an important role in this reduction, the greatest single factor probably has been the institution of intestinal decompression. In the presuction era Scudder¹ and McIver² reported mortalities of 60 and 40 percent respectively while in 1939 just seven years after McIver's experiences were published Wangenstein and associates had a mortality of 17.9 percent with the employment of intestinal decompression in their patients.

Two hundred and twenty one cases of acute small bowel obstruction were reviewed during the 1945-1953 period. The data was extracted from the clinical records of St. Francis Hospital, Evanston, Ill., and this hospital. Acute mechanical and vascular occlusive small bowel obstruction was verified at autopsy or surgical intervention in 185 patients. The remaining 36 patients were those responding to conservative management whose clinical picture satisfied the criteria for acute small bowel obstruction. Transient obstructions on a neurogenic basis were excluded from the study, but mesenteric thrombosis and atresias were included. The latter two types of obstructions are frequently omitted from studies of this nature because they bear unfavorable mortality rates, but in a clinical study of acute small bowel obstruction these obstructions are indistinguishable preoperatively and should be incorporated in the review.

It was noted that the incidence of acute small bowel obstruction related to surgical admissions increased from 0.36 to 0.68 percent during the latter portion period studied. This increase was probably due to adhesion band obstructions which accounted for 55 percent of the cases. This high value may be the result of the increased number of explorations of the peritoneal cavity. Hernias, intestinal anomalies, neoplasms, gallstones, mesenteric thrombosis, and regional ileitis completed the remainder of the group. Their relative incidence was in the order mentioned (fig. 1).

FACTORS INFLUENCING MORTALITY

Strangulation influences both the mortality and the treatment of this condition. Mesenteric thrombosis carries the highest strangulation rate and consequently has the highest mortality, although medical complications in this group may also influence the mortality. Neoplasms were strangulated in 25 percent of the

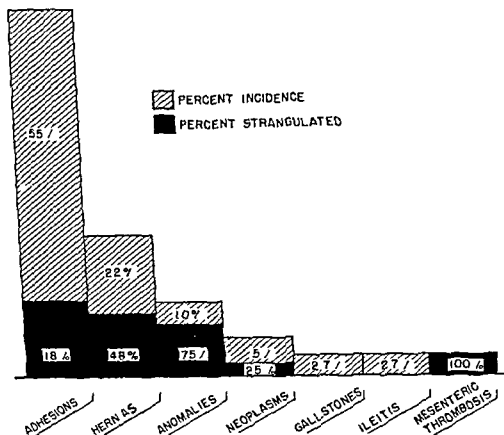
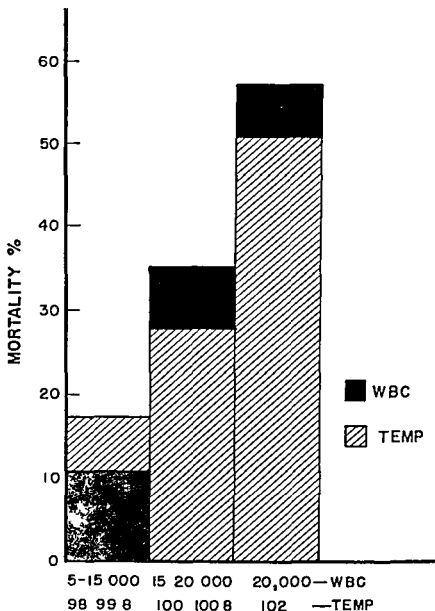


Figure 1 Cause incidence and pathologic findings in 221 patients with intestinal obstruction

patients as a result of intussusception which they had precipitated. Hernias were implicated in strangulated obstruction at a 48 percent rate notably among those resulting in strangulation obstruction were Richter's femoral, and internal hernias. Adhesions were responsible for a relatively low incidence of 18 percent, because of this low strangulation rate conservative therapy may only be justified in this form of obstruction. In general, 32 percent of the acute obstructions had impairment of the blood supply. A striking relation of the degree of leukocytosis and febrile response in strangulation to mortality may be illustrated by plotting them against the mortality (fig 2).

Closed Loop A particular problem in the study was that of closed loop obstruction that is the gastrointestinal tract is obstructed at two separate points and in effect isolates an obstructed loop of bowel. This occurs in volvulus and internal hernia and was observed in 10 percent of our patients. Of these



Figur 2. The relation ship of the temperature and white blood cell count to the mortality

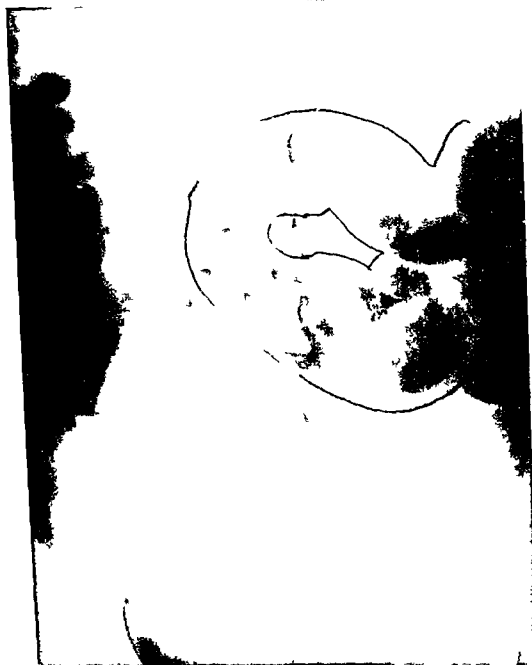


Figure 3 Roentgenogram of a patient who was not clinically distended but roentgenographic examination revealed a strangulated closed loop obstruction (outlined)

91 percent were strangulated and caused a mortality of 27 percent. The basic problem was the difficulty in making the diagnosis sufficiently early. Consequently, advanced pathologic changes were found at laparotomy or the diagnosis was entirely missed. Complicating the delay in diagnosis is the disturbing knowledge that strangulation proceeds more rapidly in closed loop obstruction. The classical signs of acute small bowel ob-

struction are minimal in these cases vomiting and obstipation occur less frequently. Of our patients with a closed loop obstruction only 23 percent had abdominal distention and in only 50 percent did the roentgenograms reveal a distended loop and could an abdominal mass be palpated (figs 3 and 4). Probably the most reliable criteria in management was to observe for signs of im-



Fig 4. Photograph of the loop of dilated ileum which was observed through the abdominal wall (fig 3).

pending strangulation increased pain increased abdominal tenderness increased pulse rate development of a palpable mass and finally signs of absolute strangulation muscle spasm rebound tenderness fever leukocytosis and finally shock.

Delay and Operative Procedure Delay by the patient in seeking medical aid results in increased mortality. A rising mortality rate is noted when the delay or the duration of unrelieved symptoms is plotted against the mortality particularly after 48 hours prior to the institution of some definitive form of treatment.

It follows that in neglected cases with advanced pathologic changes in the bowel, more extensive surgery must be performed in a patient whose electrolyte and fluid reserves are already depleted. The effect of this experience on the mortality is clearly illustrated in table 1.

TABLE 1 Relation of operative procedure to mortality rate in 176 patients

Surgical procedure	Number of patients	Mortality rate (percent)
Release of obstruction	112	9
Release of nongangrenous bowel	16	6.2
Resection of gangrenous bowel	33	30.9
Resection of perforated gangrenous bowel	15	40.0
Total	176	10.2

Limiting Conservative Therapy Although intestinal decompression has markedly reduced mortality rates, its misuse may actually increase mortality. It appears that the hazard of unnecessary surgery is less than the failure to relieve obstruction by conservative means. Definitive decompression therapy must not be used in the presence of strangulation or continued in the absence of signs of improvement. The point of the need for surgical intervention due to strangulation is much sharper than the point at which the failure of decompression therapy necessitates operation. Therefore the period of conservative treatment, if unsuccessful, should be limited to 24 hours; operative intervention is then mandatory inasmuch as further delay is associated with a rapidly increasing mortality. In 68 cases a definitive form of decompression therapy was initiated and although the suction tube passed the pylorus in over 80 percent of the patients, a satisfactory outcome resulted in only 32. In the remaining 36 patients, surgical intervention followed a period of unsuccessful conservative therapy. The mortality was proportional to persistence of conservative therapy in face of the failure to relieve the obstruction (table 2).

It may be noted that the 16.6 percent mortality in this group was higher than the over-all mortality of all forms of intestinal obstruction included in this study. In further contrast, a mortality of only 8.3 percent was noted in the 130 patients who underwent

immediate surgical relief for all forms of acute small bowel obstructions

Pathology The basic pathologic process has its own inherent mortality as illustrated by the deaths due to mesenteric thrombosis and neoplastic obstructions. Surgical mortality rates of 75 and 25 percent are noted in these obstructions. Mortality rates due to congenital defects, adhesions, regional ileitis, and gallstones followed in that order. An over all mortality rate of 10.2 percent in the entire surgical group of 176 patients was recorded.

TABLE 2. The mortality rate in patients with small bowel obstruction

Duration of illness (hours)	Number of patients	Mortality (percent)
0-24	10	0
24-48	9	11
48-72	8	25
72-96	4	50
96-120	5	20
Total	36	16.6

Age The greatest mortality fell in the youngest (0 to 10) and the oldest (70 plus) age groups. In the very young the high rate (15.3 percent) was due to multiple congenital deformities and the generally poor surgical risk in the newborn. The older age group carried a 19.2 percent mortality and was primarily due to poor renal and cardiac reserve and low resistance to infection. The mortality was fairly uniform in the mid-age groups: from 10 to 30, 5.5 percent; from 30 to 50, 5.8 percent; and from 50 to 70 years, 9.9 percent.

CAUSE OF DEATH

The age of the patient influences the operative mortality as implied by the incidence of cardiac failure in 28 percent and that of bronchopneumonia in 11 percent as the cause of death, however, adequate medical management may even reduce these figures. Shock and peritonitis were responsible for 39 percent of the deaths and could have been prevented by earlier diagnosis and therapy. Electrolyte imbalance, responsible for 22 percent of the deaths, and bronchopneumonia may be minimized by limiting unsuccessful decompression therapy.

It was gratifying to note a decline in the surgical mortality in the short period studied. In the earlier portion of the period studied the mortality was 14 percent, which had decreased to 6.6 percent at the end of study.

SUMMARY

The incidence of acute small bowel obstruction is increasing as a result of greater frequency of surgical exploration and increasing longevity of the present-day patient. Mortality in this condition may be reduced by earlier diagnosis of strangulation obstruction, recognition of closed loop obstruction, limiting unsuccessful decompression therapy to 24 hours, use of wide-spectrum antibiotics, and judicious use of fluid and electrolyte balance.

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URINARY INCONTINENCE

The problem of curing incontinence in the female is a dual procedure. First, all pathologic conditions within the urethra itself must be removed, and second, necessary repair of any of the other factors responsible for lowered urethral resistance must also be accomplished, including the strengthening of pubourethral ligaments. The reason for a 15 to 20 percent failure of surgical procedures to cure incontinence is that most surgical operations are designed to correct only one or two of the factors responsible for lowered urethral resistance. Before any surgical procedure is undertaken it is necessary to examine and test all of the factors responsible for continence. This assumes a careful painstaking history, a general physical examination, complete urological investigation and a complete gynecologic survey.

—HAROLD T. LOW, M.D.

in *Rocky Mountain Medical Journal*
P. 519, June 1954.

SURGERY OF NONTRAUMATIC CARDIOVASCULAR LESIONS IN KOREA

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THE progressive development so evident today in every branch of modern surgical science and technic has taken place in the field of cardiovascular surgery only within the past 15 years. Despite great interest and investigation as early as the late nineteenth century as well as such singular successes as Matas' work on aneurysms and Cutler and Levine's and Souttar's mitral valvulotomies (1923-1925), no sustained advancement against the problems of cardiovascular pathology had been made prior to the late nineteen thirties. Many surgeons of that time believed that Billroth's advice of 1883, "Let no man who hopes to retain the respect of his medical brethren dare to operate on the human heart," was well founded.

With Gross' successful ligation of the patent ductus arteriosus in 1938, Blalock and Taussig's solution in 1944 of the problem of the cyanotic child with tetralogy of Fallot, and the first successful operation for coarctation of the aorta by Crafoord in the same year, the golden age of cardiovascular surgery began. That the specialty has been rapidly and thoroughly though certainly not yet completely developed in these few years is attested to by the multiplicity of conditions now amenable to surgical correction and by the low mortality associated with the operative procedures.

Gross has recently reported an over all mortality of 1.7 per cent in 508 patients in whom the patent ductus arteriosus was completely divided. In those patients without failure or infection prior to operation, the mortality rate was less than 0.5 percent. Potts has had no deaths in 214 operations for the same condition in children from 10 months to 15 years of age.

In handling the more complicated problem of pulmonary stenosis as a component of tetralogy of Fallot, Taussig and Bowers¹⁰ reported an immediate mortality of 15 percent in 857 patients. The over all loss in this series was 17 percent. In a group of patients

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with isolated pulmonary stenosis treated by valvulotomy through the ventricular wall, excellent results were obtained in 61, with an over all mortality of 13 percent ¹¹

Bahnon¹² reported operative repair of coarctation of the aorta in 119 patients with a mortality of only nine percent. Similarly, Gross¹³ reviewed 100 operations for coarctation (nine of which were for exploration alone) and found a mortality of 11 percent, however, in the last 100 patients reported by him there were but two deaths ¹⁴ He ascribed this improvement to better selection of patients the avoidance of cyclopropane anesthesia, and increasing experience with the operation

A dramatic illustration of the rapid growth and improvement of cardiac surgery is shown in the fulfillment of Bailey's¹⁵ some what startling prediction in 1949 that the mortality of valvulotomies for mitral stenosis could be reduced to five percent. His group at Hahnemann Hospital have already attained that goal ¹⁶

Let it be assumed that these excellent results are obtained only by those having the greatest experience with each particular procedure, results of other workers should be noted. Glenn and Whittemore¹⁷ in reporting 100 operations performed for congenital heart disease at Yale University Hospital reviewed 44 operations for patent ductus arteriosus (28 divisions, 16 ligations), none of which resulted in death. They performed the Blalock Taussig procedure on 25 patients with tetralogy of Fallot with a mortality of eight percent and resected 15 coarctations with the loss of one patient. At the New York Hospital Cornell Medical Center,¹⁸ 33 operations for patent ductus arteriosus have been done with no deaths, a similar number of mitral valvulotomies with a mortality of six percent, and 23 operations for coarctation of the aorta with a mortality of five percent.

These results indicate that cardiovascular surgery has reached maturity and is no longer a prohibited, awesome field. During this maturation many surgeons have gained experience in this type of surgery. Many of the simpler conditions affecting the heart and great vessels are readily diagnosed by routine means and similarly can be handled surgically in a relatively routine manner. It is our belief that, when necessary, these less complex problems can be handled successfully by experienced men in the average hospital offering the usual if not ideal, facilities. The Korean conflict has demonstrated not only the advisability but the feasibility of early arterial surgery with repair by anastomosis or grafting in just such installations. The success of this program and the number of limbs saved by this positive approach is encouraging ¹⁹ Though the extremely low mortality of the larger centers may not be equaled in such nontraumatic

epilepsy do not have the paroxysmal dysrhythmia of the spike dome formation. All agree the grand mal convulsions of epilepsy are relatively easy for a trained observer to recognize, but many people who have seizures and normal electroencephalograms subsequently are retained on active service until the diagnosis

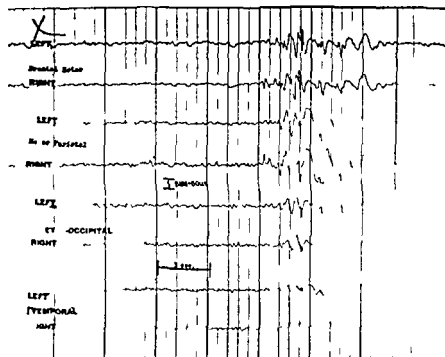


Figure 2. Electroencephalogram illustrating the typical alpha rhythm in a normal person.

is clinically established. Therefore the need for evoking an abnormal electroencephalographic tracing in otherwise apparently normal persons becomes of paramount importance.

METHOD

It has been the policy of this hospital in suspected cases of convulsive disorder to record a minimum of five electroencephalograms. These are done at daily intervals. The fifth tracing is obtained during intravenous activation by metrazol, which is injected at the rate of 100 mg per minute until a total of 300 mg is reached. Most of the breakdowns occur after 200 mg are given. All of them occur within 10 seconds after administration of the 300 mg.

A control group of 100 preshock electroencephalographic tracings with metrazol activation in psychotic patients was

compared with 100 metrazol activated electroencephalographic tracings on clinically verified epileptic patients who showed previous normal records The results are tabulated in table 1

TABLE 1 *Incidence of electroencephalographic findings in epileptic and psychotic patients receiving metrazol*

Diagnosis	Number of patients	Electroencephalographic findings			
		Normal	Borderline	Paroxysmal dysrhythmia	Spike-dome discharge
Epilep y	100	22	3	35	40
Psychosis	100	86	7	6	1

From this table it may be seen that of the 100 clinically confirmed epileptics, 22 revealed normal electroencephalograms, three were borderline, 35 showed a conventional paroxysmal dysrhythmia, and 40 a paroxysmal dysrhythmia with a spiko dome configuration Only one of the group of psychotic patients who had a paroxysmal dysrhythmia showed the spiko dome complex Cohn and associates³ indicated this relationship in their series of 75 cases It is interesting to note that of this series 13 of the

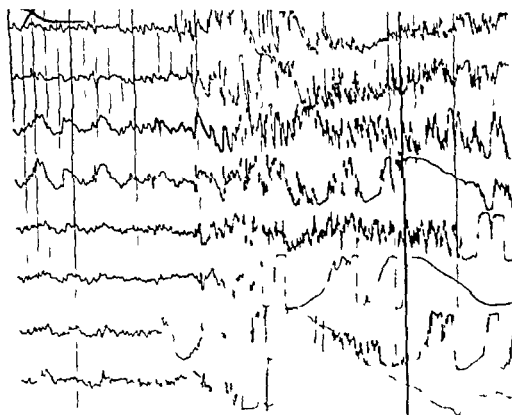


Figure 3 *Electroencephalographic tracing of a metrazol precipitated convulsion illustrating the total spike-dome discharge*

confirmed epileptics had grand mal seizures during metrazol activation. It is also noteworthy that during these seizures the electroencephalogram universally showed an initial spike-dome discharge (fig. 3). This was followed by the usual build up in amplitude and frequency.

CONCLUSION

The use of electroencephalographic tracings as a diagnostic aid in establishing the presence of idiopathic epilepsy is adequately delineated in the literature. In the military service however the burden of proof for this diagnosis rests with the neurologist. Procedures to expedite the validity of the diagnosis are therefore stressed. The methods described for establishing the diagnosis at this hospital furnish what we consider ample evidence to support the diagnosis. The results of the data obtained from the records of 100 metrazol activated epileptic patients were compared with those of 100 psychotic patients. The conclusion drawn would tend to indicate that the spike dome discharge occurring during metrazol activation is of much more diagnostic significance than the nonspecific generalized paroxysmal dysrhythmia.

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PRIMARY CANCER OF THE LUNG

Carcinoma of the lung is the most common visceral cancer in man; it accounted for over 24,000 deaths in the United States during 1953. It has been estimated that the incidence of lung cancer has increased 1,500 percent during the past 25 years. It is difficult to explain this increase on the basis of longevity, increased population, and errors in pathological interpretation 25 years ago. The cause remains unknown, although excessive cigarette smoking over long periods of time has come under suspicion as a probable factor of importance.

—FRANK PHILIP COLEMAN, M.D.

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GASTRIC RESECTION IN MILITARY PERSONNEL

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MANY surgeons believe that in gastrectomy for peptic ulcer the more of the organ that is removed, the less likelihood there is for recurrence of the ulcer¹⁻³ Increasingly radical procedures have been done removing as much as seven eighths of the stomach in an attempt to reduce to a minimum the recurrence rate and to produce a persistent achlorhydria This has been successful in large series which show a recurrence rate of two percent or less¹⁻⁴

These seemingly excellent results, however, have been marred by an increasing number of patients who though cured of peptic ulcer by partial gastric resection become partially disabled because of vomiting colic, dumping syndrome inability to maintain weight, or other disabling symptoms Johnson and Orr found that in 222 patients following radical gastrectomies (removal of from four fifths to seven eighths of the stomach) 42 percent had colic, 24 percent had vomiting or regurgitation of bile, and 47 percent had dumping or hypoglycemic syndromes Only 42 percent said that they were cured of their stomach trouble Analyzing the results in 670 patients who had a more conservative gastrectomy (removal of two thirds of the stomach) they found that only 18 percent had colic 14 percent had vomiting or regurgitation of bile and 18 percent had dumping or hypoglycemic syndromes Sixty percent believed they were cured "

In military surgery the object is to "maintain the fighting strength or return as many patients to full military duty as possible Whether a man is partially disabled because of recurrent ulcer or because of a smaller stomach is of little consequence It would seem therefore that a policy in the military service of conservative resection of about two thirds of the stomach for duodenal ulcer is indicated The resection must be varied for gastric or duodenal ulcer malignant or benign ulcer high or low gastric acidity, and other findings In addition the estimation of the amount of stomach removed is difficult Weighing the stomach is inaccurate because of variation in the amount of fat and of edema Depending on the amount of duodenal obstruction, there may be considerable hypertrophy of the stom

ach wall. An estimation of square centimeters of stomach wall removed does not take into account the total original size of the stomach. The amount of tissue remaining is the important factor. Wangenstein and Lannin devised a formula by which they attempted to determine the percent of tissue removed, but its accuracy has not been proved. Possibly the best method is for the surgeon to make a careful estimate in consecutive cases of the size of both the removed and remaining portions of the stomach.

During the past three and one-half years this procedure has been carried out at this hospital. Most gastrectomies have been done by or with the assistance of the same surgeon. Most have been of the posterior Polya type, using a very short jejunal loop in which about two thirds of the stomach was excised for the average duodenal ulcer. The patients on whom gastrectomy for duodenal ulcer was performed had been completely incapacitated because of obstruction, repeated hemorrhage, recurrent perforation, or failure of medical treatment. One patient was operated on because of massive uncontrollable acute bleeding from a large penetrating duodenal ulcer. There were no deaths or complications. Of the 30 patients who had partial gastrectomies during the past three and one-half years, 16 have been followed for a period of one year or more. Ten of these were operated on for duodenal ulcer, five for gastric ulcer, and one for carcinoma of the stomach. All 16 are employed full time either in the military service or in a civilian job. Two occasionally have vomiting or regurgitation, but the others are free of symptoms. Although this series is too small to draw any conclusion, it supports the observations and results of others.

CONCLUSION

It is suggested that in the surgical treatment of persons with peptic ulcer in the military service, a conservative gastrectomy with removal of about two thirds of the stomach will permit such patients to perform a maximum of effective duty.

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MAJOR GENERAL SILAS B HAYS
Deputy Surgeon General U S Army

Who was this man and what was he? Although his triumphs were in the field of medicine, he was not in the ordinary sense of the word a scientist nor was he a great clinician. Primarily Gorgas was a soldier and an administrator. He was probably the greatest sanitarian of all time. He was Surgeon General of the Army and he became President of the American Medical Association. He was an international consultant on health problems. During all of his triumphs he remained a gentleman in the tradition of the Old South, honest and unassuming. Even while he was engaged in his hardest work, he loved to join with his charming wife in entertaining his many friends. He led a full and happy life.

Urban yellow fever which he was destined to help conquer played an almost uncanny role in his life. His father a West Point graduate and an ordnance officer in the regular Army was in command of the arsenal at Mount Vernon a few miles from Mobile in 1853 when one of the worst epidemics of yellow fever swept the Gulf states. New Orleans, Vicksburg, Biloxi and Mobile were all stricken. Many of the residents of Mobile repaired to Mount Vernon to avoid infection. One of these was Amelia Gayle daughter of the Governor of Alabama. Captain

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Gorgas became her suitor and after a short courtship they were married. On 3 October 1851 their first son William Crawford Gorgas was born at the old Gayle place at Toulminville near Mobile. A Mobile physician Dr Josiah Nott of whom more will be said later was the obstetrician.

Young Gorgas' childhood was spent at various military posts. In 1860 his father like Robert E. Lee and many other great military men cast his lot with the Confederacy and became Chief of Ordnance of the Confederate Army. Following the war Gorgas' father served as President of the University of the South at Sewanee, Tenn. It was here that young Gorgas completed his undergraduate education. Throughout his youth he yearned for a military career and tried on many occasions to secure an appointment to West Point. Failing in this and apparently only as a means to an end he decided to study medicine so that he could enter the Army as a doctor. It appears that although this expedient was somewhat distasteful to him at the outset he soon became enthusiastic about his studies and was an excellent student.

In 1878 an incident concerning yellow fever occurred while he was attending medical school in New York. Memphis was having a serious epidemic—17 000 cases—which resulted in 5 000 deaths. Gorgas along with several other medical students who had decided to volunteer their services proceeded to that stricken community. Officials met them however and politely refused to let them into the city as none of them had had the disease and hence were not immune. They returned to New York and to their studies without seeing a patient.

On completion of his internship at Bellevue Hospital in New York Gorgas successfully passed the examination for entrance into the Medical Corps of the regular Army and was commissioned a first lieutenant in June 1880. One of his first assignments was at Fort Brown near Brownsville, Tex. and here again yellow fever exerted its influence on his life. The disease was prevalent when he reported for duty not only in the Fort itself but also in Brownsville and in Matamoros across the river in old Mexico. Marie Doughty a young lady who was visiting relatives at Fort Brown became ill with the fever and Gorgas attended her. Soon he too was stricken. Fortunately neither died and during convalescence they saw a great deal of each other. Their illness was responsible for two things: it gave Gorgas immunity so that he could work with yellow fever without fear of infection and it was instrumental in bringing him a wife. Two years later he and Marie were married.

From the standpoint of his major accomplishments the next 18 years were uneventful. He served at many posts and performed

his duties creditably as a medical officer. In 1898 came the Spanish American War. Following hostilities the United States established an occupation force in Cuba, with Leonard Wood as



Gorgas as a youth. His father was chief ordnance officer of the Confederate Army.

Military Governor. It is interesting that Leonard Wood himself was an Army physician who had left the practice of medicine to become a line officer. During the war with Spain he was the commander of the famous Rough Riders with Theodore Roosevelt as his assistant.

It is impossible to discuss Gorgas without discussing yellow fever. Havana in those days was a hotbed of disease. Malaria and the intestinal diseases were rampant but yellow fever with its high mortality was the most serious. For 300 years this disease had plagued the Western Hemisphere. Its focus seemed to be in the tropics but at irregular intervals it suddenly would strike temperate regions always in the summer and always following trade routes. An epidemic in Philadelphia in 1793 killed about 4,000 people. Baltimore, Charleston, Norfolk and other East Coast cities were involved on many occasions but the Gulf Coast suffered most severely, with epidemics being re-

corded frequently in Mobile New Orleans Pensacola and Galveston In 1853 New Orleans had 8 100 deaths and Mobile had 1 191 out of a population of 18 000 A brief description of the Memphis epidemic of 1878 illustrates the devastating effect of yellow fever on a community The following is a quotation from Dr S R Bruesch's report on the disasters and epidemics of Memphis

When 22 new cases were announced the morning of August 15 the citizen began a rush passing all bound and limits of sense to get out of Memphis Those who could leave easily were convinced when 33 new cases were announced on the sixteenth of August and the whole population was precipitated into panic All business was stopped stores and office were closed Although railroads were the most popular means of escape every possible precaution was put to use In less than 10 days (by August 24) 25 000 people had fled from the city leaving fewer than 20 000 persons to face the consequences of an enemy they could not escape By mid September it was estimated that the population numbered 19 600 of whom 14 000 were Negroes When the epidemic ended in the latter part of October roughly 17 600 cases of yellow fever had occurred out of this population of somewhat less than 20 000 The mortality was placed at 5 150 although the exact number cannot be known The mortality rate was much higher in the white population (75 percent) than among the Negroes (7 percent) It is estimated that not more than 200 of the white persons remaining in the city escaped contracting the disease As in 1873 the toll was heavy among the Catholic Irish and in fact practically eliminated this group from Memphis

This report by its outlook gives some idea of the desolation brought on by the epidemic

To strangers the aspect of Memphis during the epidemic was most appalling The principal thoroughfares as well as the lanes ally and sidewalk were saturated with limoniac acid and other ill odored disinfectant The streets were obscured with smoke of ignited tar and their evaporation combustible with a view to scatter and dissipate the spores Baskets of blankets whereupon patients died might be seen burning at almost every street corner You might walk several miles on Main Street the principal thoroughfare and not meet five persons Wagons and carriages were so seldom seen that their appearance lent an air of dreariness to the scene Outside each undertaker's shop were piles of not mountains of coffins or improvised boxes for the poor The only evidence of living humanity seemed to be the hearses and vehicles carrying the dead to the different cemeteries

Signs of recovery were not so rapid in Memphis after the epidemic of 1878 as they were in 1873 Thousands of the refugees never re-



When this photograph was made in 1901 Major Gorgas had completed the job of eradicating yellow fever from Havana. In response to Secretary of War El hu Root's request for special recognition from the Government of the United States Congress passed an act promoting him to the grade of permanent colonel in March 1903.

turned. The municipal government went increasingly into debt and finally surrendered its chart to the Legislature and the city of Memphis finally speaking came to an end.

With the end of epidemic yellow fever in 1879 Memphis was relieved of its major peril from the river and once again could take advantage of the water of the Mississippi for commerce and transportation. A new population moved into the deserted city mostly from surrounding agricultural communities to replace the Irish, Germans, and the old-time aristocracy who either died in the epidemic or fled from the city. Memphis had managed somehow to survive the worst disaster and epidemic which the mighty Mississippi River could thrust upon its citizens. But Memphis did not survive unscathed to this day a close observer may find signs of these scars in the cultural and social life of the city.

How was this disease transmitted? Literature medical as well as nonmedical was replete with learned opinions on this problem. Most of these consisted of two principal theories: that it was caused by miasmas or noxious vapors arising from swamps or that filth and decaying matter were responsible. To a doctor in Mobile, Ala., goes the credit for first publishing the concept that insects transmitted the disease. Dr. Josiah C. Nott published a remarkable report in the *New Orleans Medical and Surgical Journal* for March 1848. I will quote only excerpts from his lengthy article:

The morbid cause of yellow fever is not amenable to any of the laws of gases vapors emanations et cetera but has an inherent power of propagation which accords in many respects with the peculiar habits and instincts of mosquitoes. All the attempts heretofore made to counteract for the greater activity of (the) cause of yellow fever at night have failed and in my opinion the fact may be much better explained by reference to the habits of insect life.

Josiah Nott lived before the age of experimental medicine. He was content to support his brilliant deductions by philosophy and logic rather than by scientific proof. Perhaps the tragedy of the loss of four of his children due to yellow fever five years later in 1853 discouraged him from further work on his theory. It will be recalled that Josiah Nott officiated at Gorgas' birth on 3 October 1854. How strange that the doctor who first published the correct theory of the transmission of yellow fever assisted at the birth of the man who was destined to conquer the disease.

More than 25 years later in 1881—and now we are entering into the era of scientific medicine—another brilliant man, Dr. Carlos Finlay of Havana, Cuba, also advanced the theory that

the disease was transmitted by the mosquito. Using human volunteers he attempted to produce infections always without success. Finlay clung tenaciously to his theory, however, advancing it so continuously that eventually he came to be considered almost a crank. This was the situation in Havana in 1900. Gorgas knew Finlay, was familiar with his theory and with his failures to substantiate it. Along with nearly everyone except Finlay, Gorgas subscribed to the theory that filth was the cause of the disease. Havana had been wracked for years by civil wars and was extremely filthy. Refuse rotted in the streets drawing swarms of flies and other insects. There was no sewage system and the unpaved streets were filled with puddles of water after every tropical rain. Gorgas, with Governor Wood's powerful backing, rolled up his sleeves and went to work. In the course of a year he transformed Havana. Refuse was cleaned up, houses were scrubbed and fumigated, sewage systems were built, and the appearance and smell of the city were completely renovated.

The incidence of all communicable diseases decreased markedly and Havana became a healthy place in which to live. Even yellow fever waned and Gorgas reported to Governor Wood that Havana was cleaner than any city in the world. Three weeks later the worst epidemic of yellow fever in years struck Havana! It was clear that filth was not responsible for contagion and that cleanliness alone did not prevent transmission of the disease.

At this time the Surgeon General of the Army sent a commission to Cuba to study the transmission of yellow fever. The work of this commission, headed by Major Walter Reed, is an epic in the history of medicine and in all fairness it must be said an epic in which Gorgas had no appreciable part. Reed and his colleagues, by brilliant experimental work in Cuba in 1900, proved that urban yellow fever was transmitted only by a certain species of mosquito and only according to definite rules, namely, that the mosquito became infected by biting an ill person in the first few days of the disease and that at least 12 more days were required before a mosquito could produce the infection in another human. These precise time factors explained why Finlay had failed in his many experiments. The commission also proved that the disease could not be contracted by contact with a patient nor could it be contracted from filth and decaying matter. Gorgas followed the commission's work closely and having failed to stamp out yellow fever by cleanliness, he was ready to accept the commission's findings reported in February, 1901, and to substantiate on a large scale and under natural conditions the conclusions which Reed and his colleagues had reached by careful experimentation with a few cases under carefully controlled conditions.

Gorgas now had something with which to work. All the energy and zeal which had been directed to cleaning up Havana now were channeled into ridding the city of the guilty species of mosquito. Fortunately this mosquito was a domesticated type. Its favorite habitat and breeding place was the crowded city. Its favorite blood was the blood of human beings and for egg laying it preferred clean quiet water in and around homes. Gorgas the soldier attacked this mosquito with a military campaign. He divided the city into districts and smaller subdivisions and established an organization in which responsibility was successively delegated down to the man responsible for only a few houses in his segment of the city. All water was eliminated, screened or covered with oil, not only in ponds and puddles but in the rain barrels and crocks used in every home. Inspections were repeated every few days so that larvae could be killed before they were hatched. What exquisite tact must have been used in dealing with excitable housewives of Spanish extraction.

Gorgas started his antimosquito campaign in the first part of March 1901. The last case of yellow fever in the city was reported on 28 September. In eight months yellow fever which had been present in Havana for almost 300 years had been eliminated.

Who gets the credit? Nott for his deductions which were ignored? Finlay for a theory which he unfortunately was unable to prove? Reed and his commission for their brilliant research? Or Gorgas for his zealous application of scientific knowledge? The question answers itself—there is glory enough for all.

We now turn to the next chapter in Gorgas' life—the Panama Canal.

There had been dreams of a waterway across the Isthmus since the time that Balboa led his explorers across that narrow strip of land in 1513. As a result of the Gold Rush to California in 1850 a railroad was built across the Isthmus, mostly with Chinese and Negro labor. Malaria, yellow fever and other tropical diseases were rampant and it is said that there was a grave for every tie laid for that railroad. In 1880 the French undertook the construction of the Canal. In the course of nine years over 20,000 laborers died of the disease. Some groups of employees from France suffered over 75 percent mortality in their first three months in Panama. The project was finally abandoned by the French but shortly after the turn of the century the United States signed a treaty with Panama and made plans to complete the construction of the Canal which the French had begun. President Theodore Roosevelt, realizing the importance of conquering the disease if the Canal was to be built and being familiar with

Gorgas' work in Havana, appointed him as the Chief Sanitary Officer of the Canal Zone in 1904

In Panama the problem facing Gorgas was much different from that in Havana. In Havana he had had the solid backing of the military governor, and he was concerned only with the city of Havana. The construction of the Canal was under a commission composed of persons who if they were familiar with the Havana



In 1904 Colonel Gorgas was appointed Chief Sanitary Officer of the Canal Zone by President Theodore Roosevelt. He is shown here in Panama during the construction of the Canal.

experience, apparently did not realize its importance, and they were not inclined to support Gorgas with the money, supplies, and personnel which he felt were required to clean up the Canal Zone. Further, the problem in the Canal Zone was not restricted to an established city but involved towns on both sides of the Isthmus plus construction camps along the course of the Canal. The problem of the jungle was always present, because it tended to encroach on any area which had been cleared. In Panama Gorgas' problem was not only yellow fever but also the control of all types of disease, because only by making the Canal Zone a healthful place in which to work could the Canal be constructed.

Gorgas' triumphs in Panama were even greater than those in Havana. From May 1906 until the Canal was completed in 1913, no case of yellow fever occurred in the Zone. Malaria proved more stubborn, because the mosquito which carries it is not

housebroken but breeds and thrives in swamps jungles and any stagnant water

Here again as he had in Havana Gorgas planned and executed a military campaign against the mosquito. Each locale was divided into districts each being supervised by an inspector. He instituted an "Anopheles Brigade" to eradicate the malaria mosquitoes and a "Stegomyia Brigade" to eradicate the yellow fever mosquitoes. His success can be attributed to several factors. First he saw a problem and addressed himself exclusively to that problem. Second he developed a plan to deal with it and an organization through which his plan could be executed. Third by his tenacity and at the same time his tact and spirit of co-operation he was able to accomplish his mission where others would have failed.

Under his leadership and management the Canal Zone was transformed from a hotbed of tropical disease into a healthful place in which to live and work. Gorgas estimated that the health of the construction force as measured in man days lost because of sickness was 13 times better than under the French. He stated further: "During the 10 years of construction we lost by death 6 630 men. If sanitary conditions had remained as they had been previous to 1904 we should have lost 78 000."

His successes brought him fame long before the Canal was completed. Men and commissions from all parts of the world who were interested in tropical medicine came to Panama to see what Gorgas had accomplished and how he had gone about his work. In 1909 while he was still in Panama the physicians of the United States gave him their greatest honor by electing him President of the American Medical Association. His fame had spread around the world and in 1913 before the Canal was finished the British government called on him for recommendations and assistance on health problems in connection with miners in South Africa. With a small group he proceeded to South Africa and was able to give sound advice which resulted in improvement in the health of the miners. In January 1914 while still in South Africa he received word that he had been appointed Surgeon General of the United States Army. He returned home by way of England where he received numerous honors from medical societies and universities.

In 1916 Gorgas was invited to travel in South America to assist in solving problems connected with yellow fever and other tropical diseases. These four months were probably the most enjoyable of his life. The trip became something of a triumphal progress for Gorgas as he visited Ecuador Peru Colombia Venezuela and Brazil.

In 1917 the United States entered World War I. Gorgas, as Surgeon General of the Army, was responsible for the health and welfare of millions of young American soldiers. A few figures may be some index of the magnitude of his task. At the beginning of the war, there were 435 regular Army medical officers. At the time of the Armistice there were more than 32,000 in



General Gorgas was in South Africa as a consultant to the British Government on health problems among mine workers when he was notified of his selection as Surgeon General of the Army. He held this high position during World War I and retired in November 1918 shortly after the Armistice was signed.

active service At the beginning of the war the Army had less than 4 000 hospital beds When the war ended there were facilities in Army hospitals in this country for 100 000 patients

Gorgas was an effective administrator He chose excellent men as his subordinates he delegated necessary authority to them and let them do their jobs He was personally acquainted with many of the great men of American medicine and he was not reluctant to call them into the service to aid him in problems which they were best equipped to handle

Having reached 64 years of age Gorgas was retired in November 1918 In spite of his age he wanted to continue the fight with his old enemy yellow fever but fate ruled otherwise He set out on a trip to Africa to investigate yellow fever there traveling by way of Europe He became ill in Belgium and later was moved to the Queen Alexandra Military Hospital in England It was there after an illness of several weeks that he died He was given a hero's funeral and all the world mourned his passing

For a doctor interested in public health Gorgas was fortunate that he lived during the age that he did During his adult life giant strides were made in preventive medicine and the control of disease The germ theory of disease was proved and the methods of transmission of many different kinds of disease were discovered Gorgas was only one of a host of workers in these public health problems but to him must go the credit for carrying out sanitation programs which saved the lives of thousands of people and to him must go the credit for blazing the way and showing the world that through the energetic application of proved scientific principles communicable disease could be controlled

MOST EXPENSIVE PLACEBO

The most expensive placebo in current use is the vitamin tablet While I would not now attempt to derogate the therapeutic value of vitamins where definite indication exists for their use I believe most firmly that a random comparison presents less than one out of a hundred chance which vitamin is prescribed

—PAUL WILLIAMSON M D

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THE U S S BENNINGTON DISASTER

Handling and Initial Treatment of Casualties

JOHN L. ENYART *Captain (MC) USN*

AT about 0630 on the morning of 26 May 1954 the U S S *Bennington* while conducting routine air operations in southern New England waters sustained a serious explosion which involved the officers' wardroom and enlisted messing spaces on the second and third decks of the forward portion of the ship. Ninety-one persons were killed outright, 12 died later of injuries, and 203 were injured. Shortly after the explosion occurred, the commanding officer of the *Bennington* informed the commanding officer Quonset Point of the disaster and requested medical assistance. This report is an account of the handling and initial treatment of the casualties, and is presented as an object lesson for the management of possible disasters in the future.

THE DISASTER PLAN

The officer of the day at this hospital was informed by the operations officer at the Naval Air Station, Quonset Point at 0740 on 26 May 1954 that an accident had occurred aboard the U S S *Bennington* and that 100 casualties with 10 deaths had been reported. The ship's position was given as 75 miles south of the Brenton Reef Lightship and the expected arrival time at Quonset Point was 1230. The commanding officer was immediately informed and he gave instructions for the officer of the day to alert all chiefs of services and division heads for a conference to implement the hospital's disaster plan with such modifications as would be required to cope with the problem.

Additional information received raised the casualty figures to 250 and indicated that the majority of the patients would be burn casualties with some trauma. It was decided to evacuate patients from two surgical wards, one orthopedic ward, and one general medical ward in the main building of the hospital to the outlying pavilion wards. Postoperative surgical and nonambulatory orthopedic patients were to be consolidated in the remaining orthopedic ward in the main hospital building. The evacuated wards with a capacity of about 200 beds, were to be prepared

immediately for the reception of the burn casualties. After this decision it was planned to treat the burned patients by the open method with emphasis on electrolytic balance of body fluids and shock treatment. The details of the treatment were outlined and explained to the assembled medical officers who were then divided into teams and assigned to the casualty wards.

Stocks of material required for treatment of the casualties were reviewed and emergency supplies broken out for issue to the casualty wards. Immediate steps were taken to augment the supply of whole blood in the hospital's blood bank with blood from physically acceptable patient and staff donors. The chief of the nursing service made the necessary assignment of Nurse Corps personnel and arranged for procurement of nursing equipment and supplies. The personnel officer assigned additional personnel to the wards receiving casualties, the transportation section and casualty receiving section and made provision for first-aid parties to proceed to Quonset Point to accompany the casualties to this hospital. Measures were taken to control the flow of traffic within the hospital reservation and public information release procedures were established.

TRANSPORTATION OF PATIENTS

For the most part the steps taken coincided with the procedures outlined in the hospital's disaster plan. Certain modifications were made on the basis of information received concerning the type and manner of transportation of casualties. The original plan provided for the ship to proceed directly to its dock at Quonset Point and to arrive at about 1930. Small craft were to be dispatched by the naval base at Newport to be available for the transportation of casualties to Newport when the *Bennington* docked. A request was made by the commanding officer of the naval base at Newport for first-aid parties to accompany these craft and assignments were made.

The suggestion was made for the ship to anchor in the channel opposite the hospital to permit the casualties to be evacuated by small boat to the hospital's boat landing. This would have resulted in a saving of about one hour and 40 minutes in arrival time at the hospital. Before the suggestion could be adopted arrangements were made for the casualties to be airlifted by helicopter (fig. 1). Three landing points were designated at and near the hospital to which ambulances were dispatched. The naval station made fire trucks available to stand by in the event of a landing casualty.

As the severity of the situation became apparent it was obvious that additional personnel in all categories would be required. All available medical officers in the nearby forces

afloat were ordered to report to the hospital for assignment. Enlisted personnel were sent from destroyer tenders and from the naval station. The initial radio reports brought telephone calls from civilian doctors, nurses, and other civilians from the nearby communities. Civilian practitioners from Newport Hospital reported and were assigned to casualty wards. Civilian

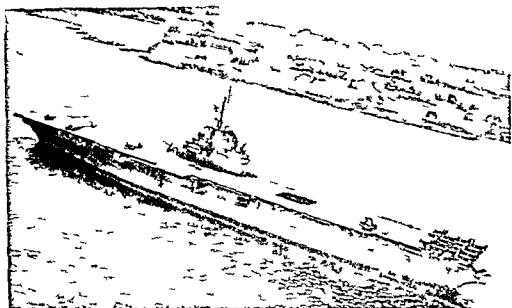


Figure 1 U S S. Bennington at the mouth of Narragansett Bay underway to Quonset Point. Three helicopters are in the process of evacuating patients.

nurses and nurses aides were directed to the chief nurse, who made assignments. As the enlisted personnel reported aboard they were screened for technical specialties and assigned to the various services where their training could be fully used.

THE PLAN IN OPERATION

At 1045 the first helicopter landed on the hospital reservation with two patients (fig 2). From that time until 1345 the helicopters shuttled back and forth, carrying patients, supplies, and personnel while the ship was proceeding to port. An adequate communication system was improvised through the use of radio equipped shore patrol vehicles at the helicopter landing sites and at the hospital entrance. Sixty four patients were brought from the ship by helicopter and later 18 more were transported by boat from Quonset Point making a total of 82 patients admitted. It is estimated that the innovation of the helicopter evacuation resulted in saving the lives of at least 40 percent of the total casualties admitted. This type of transportation also permitted a staggered admission procedure which made possible the thorough screening of the patients and their assignment to an appropriate ward depending on the type and severity of the

injury. Because of its accessibility to the casualty wards the front entrance of the hospital was substituted for the regularly designated triage station.

No attempt was made to procure admission data other than to maintain a count of patients admitted until the patients were placed in bed and treatment initiated. At that time admission teams assigned to each ward completed the admission record NAVMed Form 1985 and the personnel office prepared a master

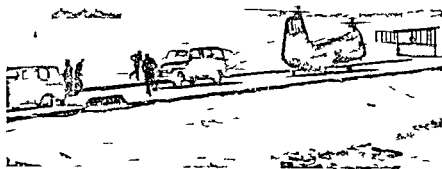


Fig 2 Helicopter landing with patients and staff of U S Naval Hospital Newport RI

casualty listing from data obtained. The Bureau of Naval Personnel directed this hospital to prepare daily progress reports for all casualties on the critically and seriously ill lists other than those whose next of kin came to this area.

Of the 82 casualties admitted 16 were classified as critically ill and 25 as seriously ill. All patients were immediately placed under treatment upon admission to the casualty wards. Because the fleet and civilian physicians had not attended the staff conference outlining the method of treatment to be used, some minor difficulties were encountered at first. This situation was resolved and the treatment proceeded as originally planned.

The shock and burn treatment teams, each consisting of a doctor, a nurse, and two hospital corpsmen, continued to function as a unit throughout the first 24 hours following the admission of the patients. When the situation stabilized, duty sections consisting of six medical officers, four nurses, and 12 hospital corpsmen were established on eight-hour watches for

each of the four wards. This routine continued in effect, with certain modifications during the first 10 days. When the condition of the patients permitted further screening was done to group the more serious cases in one ward and thus facilitate treatment and save personnel. The personnel requirements were gradually reduced until on 20 June routine duty assignments were re-established for all wards.

PROBLEM OF SUPPLIES

Shortages of supplies soon began to occur particularly of sterile goods, syringes, intravenous sets and sands, rubber gloves, rubber sheets, arm boards, blood pressure apparatus, stethoscopes, drinking tubes, and instruments. The property officer and his assistant circulated throughout the ward continually during this period and relayed requirements to the procurement section. The medical supply section of the Naval Supply Depot at Newport had been alerted and promptly processed telephonic requisitions. Some equipment and supplies were obtained from surrounding medical activities including civilian hospitals. Clothes trees and metal mosquito bars were improvised for use as intravenous stands. Frames were made from 1/2-inch metal rods to serve as cradles to keep bed clothing from burned areas on the patient.

The shortages previously noted were directly concerned with the initial phase of the problem. Because the hospital's other-wide adequate supply system was not sufficient to provide for an emergency of such magnitude, supplies of some required items were exhausted during the first day, a few during the first two or three hours. The availability of additional supplies from the depot proved of less valuable value. The open purchase of supplies required for treatment of burns and secondary infections was complicated by the long holiday weekend because most commercial medical supply houses were closed. Furthermore, the usual local sources were unable to furnish the required material in the quantities desired. This required telegraphic orders to the main supplier or manufacturer. The main items in this category consisted of parenteral antibiotics and debriding agents, both non-standard items. The procurement of six Stryker frames urgently needed for this type of casualty, was accomplished within 72 hours through telephonic order to the manufacturer and air freight delivery. The co-operation shown by all commercial suppliers during this period was excellent.

The staffing and equipping of a completely functioning radio-isotope laboratory within four days of the disaster for use in determining blood volume and extra cellular fluid volume and for other studies in connection with the treatment of these casual-

ties will be made a subject of a separate report. It is clear that the many logistic problems encountered were only surmounted through the exceptional hard work and the splendid co-operation of all personnel commands and civilian agencies.

HANDLING OF VISITORS

Because the influx of visiting relatives would create a problem steps were taken to minimize it as much as possible. A reception room near the information desk was equipped with comfortable furniture and staffed by volunteer Red Cross Gray Ladies. Arrangements were made for two chaplains to be in constant attendance. General visiting on the casualty wards was not permitted. The immediate next of kin of patients on the seriously and critically ill lists were allowed brief visiting periods of from three to five minutes twice daily. Upon their first arrival at the hospital relatives were met by a chaplain of their own faith. If visiting was permitted the visitor was provided with a surgical gown and mask and accompanied to the ward by the chaplain. Where indicated or requested an opportunity to consult with the medical officer in charge of the case was provided.

The Red Cross assisted the visitors in finding housing accommodations. Transportation was provided by the volunteer motor corps group. A section of the mess hall was assigned to those visitors who desired to purchase meals at the hospital and a small canteen was set up in the Red Cross building to provide refreshments for the relatives without charge. The local chapter of the Navy Relief Society made their services available to these families and rendered required financial assistance. This phase progressed without unpleasant incident and the command was pleased to receive many appreciative comments from departing visitors for the consideration that they had received.

During this emergency the hospital staff was augmented by 66 enlisted personnel from shore activities and forces afloat. Twenty nine medical officers reported for emergency temporary additional duty from nearby ships and naval hospitals. The research programs which assisted in the treatment of the casualties were staffed by five medical officers and eight enlisted technicians from other naval hospitals.

At this writing of the 8th patients admitted on 26 May 31 remain on the sick list. Twelve of these are presently on sick leave and will be returned to duty upon their return. Of the 41 patients whose condition was classified as critical or serious three are still being carried on the seriously ill list and 1st died of injuries received. Thirty nine patients made a complete recovery and have been returned to duty.

CONCLUSIONS

From the experience herein reported it is possible to list the chief conclusions which may be drawn from the *Bennington* disaster. An efficient organization and disaster plan must be flexible and adaptable to the existing environmental conditions. The following factors are considered essential in overall disaster planning:

1 Availability and proper use of additional specially trained personnel from other activities

2 Use of available auxiliary personnel (Red Cross, Gray Ladies, Navy Relief, Girl Scouts, convalescent patients, and civilian employees) for nonprofessional duties

3 Intensified instruction of lower rated hospital corps personnel in casualty handling procedure and periodic disaster plan drills

4 Instruction in casualty handling and evacuation by helicopter

5 Availability of mobile radio equipment for maintaining essential communications

6 Liaison of security force with civilian authorities in establishing traffic control measures

7 Adequate provisions for reception, housing, transportation, and other assistance for visiting next of kin under direction of chaplains, Red Cross, and Navy Relief

8 When possible, preliminary command conferences to outline the details of casualty reception, triage, treatment, and necessary modification of the disaster plan to meet requirements of the situation

9 Designation of staff medical officers and staff nurses in a strictly supervisory capacity of the casualty wards to correlate activities, prevent the issuance of conflicting orders, and assure proper use of nonstaff personnel

10 Use of wards that are most convenient to Central Supply, operating room, laboratory, x-ray, and diet kitchens, rather than outlying wards that are remote from essential facilities

11 Screening of requests for special drugs, equipment, and search requirements and personnel through the executive officer in order to eliminate duplication and excess procurement

12 Standardization of blood collecting and blood donor sets

13 Early conferences daily to outline the clinical progress of patients and necessary changes in treatment plans. The attendance of the personnel finance and pharmacy officers is advisable to correlate planning

14 Immediate availability of reserve medical supplies and equipment. This is an essential factor in any emergency or disaster planning. The curtailment of supply levels at medical activities requires a more realistic approach to the requirements for insurance type items as related to the accessibility of reserve stocks and to transportation difficulties under emergency conditions

It is believed that these points having been tested in an actual emergency situation will be of interest to all those responsible for evolving and activating military or civilian disaster plans

PAUL EHRLICH (1854-1954)

There are two kinds of great men: history men of action whose great deeds exercised an enlightening influence on their contemporaries and became a source of encouragement and inspiration for the generation to come; and men of thought who handed their great knowledge down to posterity in the written word.

In the history of medicine men of action were Boerhaave and Paracelsus who are remembered more for their personalities than for anything else; and men of thought were Avicenna and Vesalius whose *Canon* and *Fabryca* respectively were of such importance that they almost eclipsed the men who penned them.

But there are also men who leave behind them both great actions and great written works: men who soar to towering heights leaving in their wake a glorious scar on the face of the earth. Such a man was Paul Ehrlich of whom it can be said—to paraphrase what was said of Claude Bernard in connection with physiology—that he was not a chemotherapist but chemotherapy itself.

—FELIX MARTI IBANEZ, M.D.

Internat. J. Radiat. Oncol. Biol. Phys.
Part C, p. 143, March 1954

ON THE JOB TRAINING OF ENLISTED MEN FOR PSYCHIATRIC WARD DUTY

MILTON H. MILLER *First Lieutenant USAF (MC)*

IN considering the special problems encountered in training medical enlisted men for work on a closed psychiatric ward specific attention should be directed as well to the general problems which impede "job training" in all departments of a hospital. Although the tasks of individual medical enlisted men differ from service to service, the widespread need for continued training and the tendency to slight this need are common to almost all hospital services. Also certain similar interpersonal situations arise which prevent those who require further training from seeking it, and those who are in a position to teach from offering help.

HISTORICAL BACKGROUND

In the nine years following World War II there has been a growing awareness of the contribution made by adequately trained and conscientious members of the nonmedical staff to the care of hospitalized patients. At times that contribution is the decisive factor in determining whether a patient will recover from his illness. The comfort and rate of recovery of almost all hospitalized patients are in part dependent upon the caliber of care administered by the ward attendants, laboratory technicians, and other ancillary specialists. Hospital administrators know that the difference between hospitals with "good" and "bad" community reputations is frequently a difference in the attitude and manner of ward men, technicians, and admission desk clerks.

This growing interest in the role of medical enlisted men or aides has been especially marked in the psychiatric hospitals, both military and civilian. Prior to World War II, only a small number of mental hospitals had training programs for nonmedical employees. Today there are few mental hospitals without psychiatric aide training programs. Menninger, in describing his own experiences as manager of the new Veterans Administration Psychiatric Hospital in Topeka, Kansas, said that, "It came as a startling surprise to me that in sheer numbers of personnel, psychiatric aides are the hospital. Fifty percent, or nearly a thousand of our new employees fell into one job category—psychiatric aides. I had thought of the psychiatric hospital as a

place where doctors work assisted by others I began to think that it would be more appropriate to say that psychiatric hospitals are places where aides work assisted by nurses and doctors

He described his concept of the importance of the psychiatric aide saying that the aide—more than any other hospital employee—was in a position to exert a potent and continuous therapeutic influence on the patients in his charge It is the aide who is with the patient from minute to minute and hour to hour day after day and week after week for month after month and even year after year It is the aide who sits by the patient in lonely vigil who works with him plays with him waits upon him takes him to the toilet gives him food lights his cigarette diverts his belligerency shakes his hand when he enters the ward and when he leaves It is not only by his number but by virtue of the role he plays in the patient's recovery or otherwise that the psychiatric aide is the essence of the large mental hospital

Menninger's observations are applicable as well to the enlisted men assigned to the psychiatric service in a military hospital Because of the acute nature of many of the psychiatric disorders in the military hospital the role of the enlisted man is of particular significance Patients have not as yet settled into stereotyped behavior patterns and exhibit frequent behavioral changes Acute management problems such as suicidal gestures acute depression or destructive hyperactivity occur frequently The acutely ill psychiatric patient has an extreme need for humane and skilled care and he is likely to be more responsive to such care than will the chronically disturbed patient.

The disproportionate amount of time expended by physician and corpsmen in direct patient contact is a prominent factor in determining the importance of the corpsmen's role in assisting the psychiatrist While working as a resident physician I cared for 25 closed ward schizophrenic patients For each hour I had available for direct patient contact some 17 hours were spent by psychiatric aides in immediate association with the patients on the ward level In my current ward assignment as an Air Force psychiatrist a similar ratio exists Thus only about six percent of the potential man hours in the hospital milieu are contributed by the physician Most hospital wards are without a physician except for emergency situations for 16 hours of each day During this time the care of the patient rests with the assigned enlisted personnel and the ward nurse In the early predawn hours the hazards of these other 16 hours are too often illustrated by a suicide on the psychiatric service a Miller Abbott tube dislodged on the surgical service a femur refractured in an orthopedic patient or a temperature of 105° F ignored at the admission desk Even without such dramatic events the physician is confronted daily

with the importance of competent and efficient enlisted men in assuring his patient's well being. Many medical treatments are merely prescribed by the physician. The conversion of a written sentence on an order sheet into an event involving the adequate treatment of patients requires the intervention of ward nurses and enlisted men. Unless the men on duty on all the shifts have the training and interest to understand and carry out the physician's order, the patient on "suicidal precautions," for example, may be presented instead with a "suicidal invitation." The same is true of patients on "bed rest," "routine postoperative care," or "limited dietary intake regimen." Even the patient who is receiving penicillin will require correct temperature readings. It is probable that many medical enlisted men performing even such relatively simple tasks as recording temperatures could benefit by practice under supervision.

Many kinds of training programs have been established to train psychiatric personnel. The range of curriculum purposes and period of operation of each have varied from hospital to hospital. One of the most ambitious and carefully documented of these training programs carried out by the Menninger Foundation School for Psychiatric Aides was reported on by Hall and associates in 1952. This book contains a wealth of practical observations concerning psychiatric aide education. The authors stress the importance of clearly delineated training objectives and that the curriculum must be specifically planned in terms of the activities for which it will prepare its graduates. They point out the great value of supervising the trainees' clinical work and stress that "Learning is embedded in the interpersonal relationships which develop between the student and his supervisors and teachers." Most authors agree that a training program which consists primarily of didactic lectures from teachers, who are at the same time strangers to the psychiatric aide, are of quite limited value.

The school at Brooke Army Medical Center, San Antonio, Tex., for training enlisted men as psychiatric aides provides a period of three months' extensive study for Army and some Air Force personnel. After graduation they are assigned to the psychiatric services in various Army and Air Force hospitals. These trained men bring skills and job understanding which make them potentially effective supervisors and ward leaders. Most military personnel however assigned to work on a psychiatric service do not have the benefit of extensive training and most of what they need to know must be learned "on the job." This is true not only of psychiatric aides but of hospital employees on many services in both civilian and military hospitals. The bulk of training provided for most hospital personnel must be integrated with everyday duty. If no specific guidance is provided "on the job" en-

listed men remain poorly trained and frequently perform inadequately. For the physician to assume that because patients and medical enlisted men are placed together on the ward the enlisted men will help the patients is at best foolishly optimistic. If inadequately trained men are assigned to care for patients enlisted man, patient and physician alike will suffer the consequences.

THE MEDICAL ENLISTED MAN'S DILEMMA

The medical enlisted man assigned to the closed psychiatric ward will face a number of difficult problems. He will be locked in a ward with patients who are usually there because the symptoms of their illness were threatening to members of society. Unlike the physician and nurse he cannot retire with ease to the security of a private office (frequently some distance from the ward). Neither can he assuage his anxiety by regarding symptomatology in the detached, mental mechanistic manner so reassuring to most psychiatrists. A threat is a threat and has nothing to do with projective mechanism. The untrained man will waste or use in a nontherapeutic manner many of the hours available for patient contact. Patients with incipient schizophrenia who desperately need attention and care will be left to themselves while the hospitalized alcoholic drug addict or gregarious psychopath will receive the bulk of personnel attention. If untrained men are assigned to a closed psychiatric ward there will be many fights. Each will lead to new ones because enlisted men and patients will resent the way each is mishandled by the other. There will be many suicidal gestures, numerous missing pieces of silverware, repetitive interviews with complaining parents and frequent inquiries from the hospital administrative staff. There will be a number of requests for transfer to other duty and in the military situation recurrent absence without leave. The harassed and conscientious physician will be astonished and pained to learn that some members of the ward team believe that he neglects patients. Often these medical enlisted men are really saying, "He neglects us."

The physician too will have serious complaints about the performance and attitude of the assigned medical enlisted men. He will use such expressions as "no desire to learn," "poor caliber" and "untrainable." He will ask the hospital administrative officer for better men for work on the ward. He will have as little to do with personnel on the ward as possible.

The most serious symptom of the unhealthy ward situation will be the failure of many patients to respond to treatment which the physician had hoped would lead to recovery.

THE PHYSICIAN'S ROLE

What is the responsibility of the physician with regard to such matters? Who is ultimately to be responsible for the caliber of training given to ward personnel? How active a role must the physician play in the matter of training psychiatric personnel?

For many reasons, the physician shares in the responsibility of seeing that his patients receive competent handling from all hospital employees. In many instances, only the physician is able to judge whether his medical enlisted men are adequately trained and whether they are providing good ward nursing care. Of equal importance is the fact that educational efforts on the ward level which are not wholeheartedly supported by the ward physician face overwhelming difficulties. Whether the physician himself assumes the task of training personnel or delegates part of this assignment to someone else (nurse ward master, or non-commissioned officer in charge), the responsibility for the enlisted man's education rests with him.

REQUIREMENTS OF ON THE JOB TRAINING

A major condition for the success of any on-the-job training program for enlisted psychiatric aides is the physician's acknowledgement of the significance of the role played by nonmedical personnel in patient care. Without the physician's appreciation of their performance all medical enlisted men, trained or untrained are likely to work in a careless and indifferent manner. If the physician by expressing interest and offering supervisory help, demonstrates his awareness of the contribution made by his personnel they will respond with an increased measure of interest and devotion. The importance of job recognition as it influences the effectiveness of combat troops, factory workers, salesmen and indeed all of us is widely known and frequently discussed. In the absence of recognition and approbation, a 40-hour week seems interminable. When a worker senses that his job is important extra hours of duty seem to reinforce this concept. For the enlisted psychiatric aide, if approval for his efforts is to come at all, it must come from the physicians and nurses.

Another important condition is the establishment of adequate channels of communication between medical enlisted men and the physician. "Adequate communication" is a remarkably difficult problem in a hospital situation, probably impossible without such media as regularly held ward meetings attended by all who work on a given service or ward. The ward meeting of physician and enlisted men is the physician's tangible admission that he regards their work as important. His participation week after week in such meetings is more meaningful to personnel than any as-

surances he may utter about being a believer in the team approach. Many times important goals in training can be attained informally at such meetings and it is here that the physician can best determine those areas on which a training program should bear particular emphasis. In the absence of this kind of meeting place minor misunderstandings may assume great proportions. Should this occur the patient must bear most of the consequences.

Methodological considerations stand lower in importance than the factors described above. Most persons learn best by doing. This is true in training enlisted psychiatric aides. The physician's unadorned statement for example that he is opposed to the arm lock as a restraint method is far less helpful than his supervision of the practice in proper restraint technics would be. Do I propose that the physician serve his patients by supervising practice in humane and safe restraint? Certainly.

Several publications of the National Association for Mental Health serve as excellent readable introductions to the work of the enlisted psychiatric aide. In addition an increasing number of excellent training films are available. In a military establishment such films can usually be obtained with little difficulty through the training film library. The National Association for Mental Health also circulates a number of motion pictures on subjects of significance to those who care for the mentally ill.

In general the methodological devices used in any form of hospital employee education will vary with the preferences of the instructor and the physical limitations of the hospital. While such factors are important the success or failure of a training program for medical enlisted men is much more likely to depend upon the sense of mutual purpose and the kind of working relationship existing between the physician and the other persons who work on the ward.

CONCLUSIONS

The caliber of care given hospitalized psychiatric patients will depend in large measure upon the skill and interest of the enlisted men on the psychiatric service who care for them on a 24 hour basis. The physician must assume the final responsibility for the quality of attention administered to patients by his assistants. Many ward men assigned to care for psychiatric patients are in need of further training and almost all will require the moral and professional leadership of the physician. To lead successfully the physician must be aware of the importance of trained and enthusiastic personnel and must communicate his awareness to his enlisted assistants. Whether the physician assumes responsibility for the specific training of enlisted men or delegates this task to someone else the responsibility for the decision is his.

The emotional atmosphere which exists between the physician and ward personnel is of particular importance in the development and maintenance of any training program. In the therapeutic atmosphere created by a common purpose, adequate communication, and mutual recognition there will be little difficulty in securing adequately trained and enthusiastic personnel.

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THE LAW OF FERMENTATION

Down through the ages alcoholism has been a problem for we find in the book of Genesis that Noah became drunk after he had partaken of the juice of grapes. Alcoholism is still a problem in which society has been deeply concerned. Every conceivable means has been utilized to solve it but never with success. Probably the reason for this failure has been that only the moral aspect has been the focal point. Society ignorant and prejudiced has permitted its emotions rather than understanding and scientific knowledge to govern the methods of solution.

Americans have tried legislation by enacting the prohibition statute of the 1920's. This law was repealed because it did not keep men and women from continuing to drink alcohol. I believe we forgot one basic fact—that alcoholic beverages have attained world wide use because they are derived from the fermentation of raw materials such as staple plants, foods, fruits, and cereals. The process of fermentation by which alcohol is formed occurs in nature and man has learned it not to prevent it. Therefore the voters can never hope to solve the alcoholic problem by legislative prohibition. People can never solve it until they succeed in repealing the law of fermentation and since this law is part of life itself they can never hope to write it off the books.

—LEO B. SEDLACZKY, D.D.

in *Mississippi Medical Journal*
p. 111 Mar. 1954

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1. The first step in the process of determining the factors which influence the behavior of the individual is to identify the variables which are likely to be related to the behavior.

2. The second step is to select the variables which are to be studied. This is done by reviewing the literature and by consulting with experts in the field.

3. The third step is to design the study. This involves determining the methods of data collection and the statistical techniques to be used.

4. The fourth step is to collect the data. This is done by using the methods specified in the study design.

5. The fifth step is to analyze the data. This involves using the statistical techniques specified in the study design to determine the relationships between the variables.

endure severe battle losses with a minimum of individual combat failures " The replacement does not have this bond of unit identity and therefore initially is not as valuable a fighting entity as the veteran we lose through indiscriminate evacuation

Let us approach this matter from another angle If the physician permits wholesale evacuation of minor casualties for any cause from his outfit not only is he weakening that outfit by that many men but the situation will rapidly deteriorate and snowball until a major problem exists Consider the attitude of even the most dedicated fighting man still up on the line when he observes that other men are escaping the battle situation for something less than obviously incapacitating conditions Make no mistake while we like to wave the flag about our fighting men only a small percentage are enduring the risk of imminent death by choice and when they observe that there is an honorable way out through the medical service, who is to blame them for thinking themselves stupid in not seeking a like escape?

Lest one think that the foregoing is a slur on our fighting men let me assure you that many of them can and have carried on even to their deaths from severe wounds because of their indomitable spirit Further it has been my privilege to serve with men who violently refused evacuation although suffering from wounds or conditions such as frostbite that merited their removal from combat The point is that fighting men can and must endure more than the medical officer unaware of his responsibility realizes

THE STIGMA OF AVOIDING COMBAT

Now consider the failure of responsibility from the standpoint of the patient himself Once he has lost his unit identity by being evacuated further along the chain than his condition merits he has lost much of his combat effectiveness even if he is later returned If he has escaped the battle situation for less than indicated reasons he himself is well aware of it and while he may excuse it on the grounds that the medical officer officially aided and condoned such escape the stigma is still there Particularly is this true in the borderline psychiatric or combat fatigue cases Wholesale evacuation of this type of case actually has a most detrimental effect on the men involved as pointed out by Glass Mullen and by practically all other qualified observers In other words the sympathies of the physician who permits wholesale evacuation are not only misdirected but actually harmful to the patient

To carry out this responsibility to the command takes medical officers who are not only aware of the tremendous part they play

in combat unit effectiveness but also medical facilities in close support for treating and holding the minor types of casualties for early return to the fighting front. Air evacuation, which has been our greatest adjunct to reduction of mortality since the advent of antibiotics and whole blood, must not be considered as an easy method of solving our problems in handling casualties. For the seriously wounded, it is frequently lifesaving when overwhelming casualties occur, it is a godsend from the logistic standpoint but if overenthusiastic advocates consider it the end all of casualty handling, our avowed mission to maintain fighting strength by early return of the fighting man to duty is seriously compromised.

RESPONSIBILITY IN REAR ECHELONS

So far I have confined the discussion of our responsibility as medical officers to combat situations, but only a limited number of our medical officers can have the privilege and gratification of administering to our fighting men in the proximity of combat. A large percentage of our medical personnel must operate dispensaries and hospitals, or be attached to combat units which are not engaged in actual contact with an enemy. These medical officers also have a responsibility which cannot be ignored. How many man hours and days are lost through taking the easy way out by issuing light duty chits or keeping the patient in the hospital another week to make the next duty list? True, a man must be fit for duty before he is officially returned to duty, but let us not use this as an excuse for wasting manpower beyond the absolute necessity. In one Marine division during a particularly trying period of combat, a casual company was organized to rehabilitate men who were scheduled for return to action during which time they were given gradually increasing exercise, re-equipped, and reassigned so that when the medical officer declared them fit, not a moment's delay was encountered in getting them back to the desperate situation which the division was encountering at the time. Surely, if this can be done in a combat outfit under adverse circumstances, such a policy and organization can be set up under the more favorable circumstance of relative peace.

In regard to sick call in the dispensary or sick bay, the practice of issuing "light-duty" or "no-duty" chits indiscriminately by the inexperienced or inefficient medical officer is a classic example of failure of responsibility. In the borderline cases between those obviously fit and those obviously unfit for duty, the medical officer must be even more zealous and thorough lest his office become the means of shirking maneuvers, hikes, or everyday routine of duty. A firm attitude on the part of the unit

medical officer will also pay dividends in a decreased sick call attendance once the word gets around that riding the sick book is no longer tolerated

THE BASIC OBJECTIVE

I am prompted to write on this subject because I sincerely believe that we have strayed from our objectives. The motto of the Navy Medical Department is "To keep as many men at as many guns as many days as possible." The Army states its aim more concisely "To conserve fighting strength" and the Air Force "Keep 'em Flying." These are not hollow phrases; let us reaffirm them in our daily handling of patients under all circumstances.

We are told that in any future conflict our greatest weakness will be relative lack of manpower. To overcome this lack we must rely on providing each serviceman with a higher degree of training and skill. Such men are not produced overnight and the loss of one of them is more severely felt by us than is the loss by the enemy of 10 of our human wave adversaries. We must therefore rely on the finest of medical care dedicated to maintaining effective fighting strength. The commanders who carry the heavy responsibility for the performance of our armed services have a right to expect that we as medical officers share that responsibility.

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Students of medicine cannot be selected on the basis of academic grades alone. Important academic ability is characteristic of a student's ability to guide and help other people and intellectual curiosity are no less or even more important. I believe that these are the factors which admissions committees take into account and that the reports of discrimination based on race or other characteristics are usually completely erroneous and at the worst are greatly exaggerated. If the time should come when students of medicine are selected solely on the basis of grade, medicine and the public will suffer.

—F r m E d i a l

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Association pp 49-50 July 1954

An Unusual Retrorectal Tumor

BYRON V. WHITNEY *Lieutenant (MC) USNR*

AN accurate preoperative diagnosis of retrorectal hemangioendothelioma is difficult to make. In considering retrorectal tumors, one must include in the differential diagnosis (1) congenital conditions (ectopic pelvic kidneys, meningocele, teratoma, and chordoma), (2) neurogenic tumors (neurofibroma, ependymoma, neurilemmoma, ganglioneuroma, and ependymal glioma), (3) osseous tumors (osteogenic sarcoma, chondroma, and osteochondroma, Ewing's tumor, and giant cell tumor), (4) vascular and lymphatic tumors (hemangioendothelioma, hemangiopericytoma, lymphangioma, Hodgkin's granuloma, and lymphosarcoma), (5) soft tissue tumors (lipoma, myoma, fibroma, fibrosarcoma, and rhabdomyosarcoma), (6) inflammatory tumors (chronic infections from rectal fistula), and (7) metastatic tumors.¹⁻³

The incidence of retrorectal tumors is low. According to the Mayo Clinic statistics for a period from 1922 to 1936, they occurred only once in 40,000 admissions.⁴ From among 32,860 surgical specimens seen at this hospital from 1947 to 1953, only one retrorectal tumor, a hemangioendothelioma, was reported. In this group of 32,860 cases, there were eight other hemangioendotheliomas and two hemangiopericytomas located in various parts of the body.

Hemangioendothelioma is a rare tumor to be found anywhere in the body. At the Bellevue Hospital, only eight cases were collected in 22 years. While Bacon and associates⁵ and Forman and Campbell⁷ each reported a single case of a retroperitoneal pelvic hemangiopericytoma, Jackman and associates⁶ reported two cases of retroperitoneal pelvic hemangioendothelioma. Both occurred in young patients, one three years old, the other 15 years old.

The symptoms presented by a retrorectal tumor may be minimal, depending on the size, origin, and location of the tumor in the pelvic cavity, and on the degree of bone erosion and of involvement of the sacral nerves. Low back pain, unilateral or bilateral radiating leg pain with paresthesias and weakness, rectal pain,

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Figure 1. (A) A 1 p t n a d (B) lat 1 w B 1100
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constipation, urinary incontinence, and difficulty in voiding may be present

The diagnosis of a retrorectal tumor is made by rectal digital examination. An impression may be obtained as to the type of tumor present by its consistency, attachments, location, and by the further diagnostic studies. Final diagnosis, however, always rests with the pathologist. Other required diagnostic studies are (1) pelvic examination, to rule out associated genital pathology (2) proctoscopic and sigmoidoscopic examinations, to rule out inflammatory lesions and rectal tumors (3) roentgenograms of pelvis, to determine if bone erosion or primary bone tumor is present, (4) retrograde pyelogram, to determine the position of the kidneys and displacement of ureters, and (5) barium enema, to determine the condition of the colon and the amount of displacement of the rectosigmoid, thus giving some indication of the size of the tumor.

The development and pathology of vascular tumors has been described by Andervont,⁴ Stout and associates,⁵ and Pulford.¹⁵

Early diagnosis and radical operation are essential to the eradication of an hemangioendothelioma. Radiation treatment¹⁶⁻¹⁸ has been proved to be only palliative. Postoperative irradiation should be advised for the patient when complete surgical removal of the neoplasm is in doubt.

CASE REPORT

The patient, an 81 year old man, first consulted a physician because of dysuria of two days' duration. He had had nocturia two times for several years but denied any frequency during waking hours. Increasing constipation had been present for two years necessitating a laxative every night. One year previously the patient had right sciatic neuritis, lasting for three months and followed by weakness of the right leg. There was no weight loss. The family history revealed a high incidence of malignancy: a brother had had carcinoma of the sigmoid and died at 75 years of age, and a sister had had carcinoma of the breast and died at 69 years of age. His other sister 78 years old, was living and well.

Physical examination revealed a well preserved man who appeared no older than 60 years of age and who was apparently in good health. His head, eyes, ears, nose, and throat were essentially normal. His weight was 165 pounds. Percussion did not reveal an enlarged heart, and the rhythm was regular. There was a systolic grade I murmur at the apex. Blood pressure was 160/80. The lungs were normal. The patient had a left direct inguinal hernia supported by a truss, and a two finger sized

umbilical hernia. The liver and spleen were not palpable, and no masses could be palpated in the abdomen. The genitalia were normal. Rectal digital examination revealed the prostate to be hard, twice normal size, and regular. At the end of the examining finger posterior to the rectum was a grapefruit-sized mass which seemed to be outside the rectal wall. The mass was hard and



Figure 2. Anterior view of the patient during the examination of the right leg.

not movable. The right knee jerk and ankle jerk were slightly diminished as compared with the left. There was slight decreased muscular strength of the right leg as compared with the left but no muscular atrophy was apparent.

The laboratory studies including a complete blood count, erythrocyte sedimentation rate, Kahn, Hinton, and acid phosphatase tests, urine and stool examination, and electrocardiogram were essentially within normal limits.

Proctoscopy and sigmoidoscopy revealed the rectum to be pushed anteriorly and to the left by a hard mass which was located outside of the rectum and which did not penetrate the rectal mucosa. The sigmoidoscope was passed its entire length and no other abnormalities were visible.

A roentgenogram of the chest was negative with no enlargement of the heart or aortic abnormality apparent. A barium enema revealed diverticulosis of the descending colon and sigmoid. A large mass visible in the pelvis was displacing the rectum anteriorly and cephalad a considerable distance. The bones of the pelvis ap-

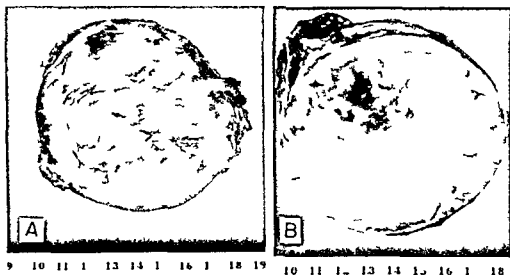


Figure 3 (A) Tumor showing the broad pedicle of attachment to the rectum and the smaller pedicle that was attached to the perirectal tissue (B) Cross section reveals hemorrhagic areas and capsule

peared to be normal (fig 1). An intravenous pyelogram was unsatisfactory, but a retrograde pyelogram providing adequate visualization of the kidneys and ureters showed no evidence of ureteral obstruction, however the right ureter was displaced to the left in its distal third (fig 2).

The preoperative diagnosis was retrorectal tumor probably malignant, possibly a sarcoma. The abdominal route was chosen because of the size of the tumor and the apparent attachment to the right ureter. A midline suprapubic incision extending from the pubis to a point above the umbilicus was made. The umbilicus was removed with repair of the umbilical hernia, in closing the abdomen. The rectum, sigmoid, and bladder were found to be pushed anteriorly and cephalad by a grapefruit-sized mass located in the floor of the pelvis, posterior to the rectum. The lateral peritoneal attachment of the sigmoid was incised and carried downward and across the rectum below the brim of the

pelvis. By careful dissection the sigmoid was freed sufficiently so that it could be retracted medially. Both the right and left ureters were identified. It was then possible to reach the tumor and by manual dissection to free it from its attachment to the sacrum posteriorly and the rectum anteriorly. The tumor was delivered and sent to pathology for frozen section. It was reported to be not malignant. Considerable bleeding was encountered while removing the tumor but this was remedied by whole blood transfusion. All bleeding was adequately stopped with ligatures and the field was dry prior to closing the posterior layer of the peritoneum.

The patient did well postoperatively. Sigmoidoscopy on the eleventh postoperative day revealed the rectal mucosa to be intact and he was discharged from the hospital on the thirteenth postoperative day. During the succeeding 18 months there has been no evidence of recurrence of the tumor.

The tumor measured 10.5 by 8 by 7 centimeters. It was encapsulated but was attached to the surrounding tissues by multiple fibrous adhesions. An anterior and posterior pedicle marked its



Fig. 4. Photomicrograph showing numerous small blood vessels lined by a single layer of endothelial cells. In addition, there are many endothelial cells which are lined by irregular thin layers of flat cells (H. & E. stain, 100x).

firm attachment to the rectum and presacral tissue (fig 3) Microscopic examination showed elongated cells closely applied around the endothelial lining cells of the capillaries. There was

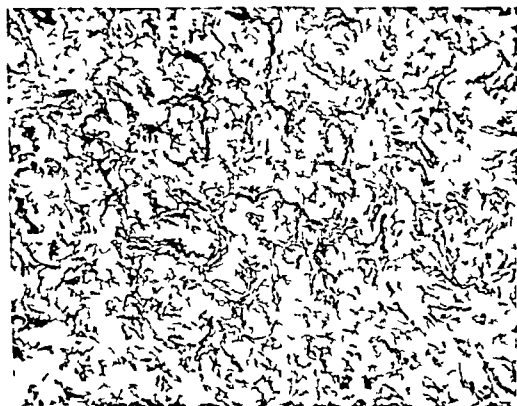


Figure 5 Photomicrograph showing fibrous sheath of blood vessels and endothelial cells within the fibrous sheath (Silver reticulin stain, x 100)

a fibrous framework around the blood vessels and the endothelial cells were located within the fibrous layer. Most of the vessels had little or no reticulin in their fibrous sheaths (figs 4 and 5). Dr. A. P. Stout reviewed the slides on this case and stated it was an hemangioendothelioma.

SUMMARY

A patient with retrorectal hemangioendothelioma presented a diagnostic problem until tissue was examined microscopically. Although this type of tumor is usually malignant, there was a two-year history of its presence, it was well encapsulated, and the prognosis should be good.

Early diagnosis and radical surgical excision are paramount for a cure; radiation treatment is only palliative.

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THE TREATMENT OF CANCER

Surg cal ope ti s de li g with cancer are g ving gratify g res lts
pro ved the di e is loc liz d and accessible and a d agnos is has
be n m de early The development of surgical technic improvem nts
n a e thes as well as in both preop r ti e and postoperative care
ha e made pos ible very radic l proc dures wh ch happily not in
frequently e lt in cure Surgeons howe er should not be tempted
to und t ke the mpossi bl or indeed as a re lt of their efforts
le ve the pati nt n such a condition th t life is w ll n gh intolerable
The age the g neral cond tion and even the temp ament of the indi
vidual sho ld be consid ed before u dertaking treatment fo n some
cases a di b lity such the los of the larynx o a permane t colo
tomy would ot be bo Very r dic l surgical perations sho ld be
confined to th se cas in wh ch there is a h p of cure Otherwise
palliative measures o ly would seem to be justified

—HAROLD WOOKEY M D

A M A A b / S g ry

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Acute Myocardial Infarction Occurring in Flight at 12,000 Feet

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TRAVELING by aircraft has become so increasingly common that it is today the preferred method of transporting ill and wounded patients.¹ Despite its frequent use there have been few reports of acute medical emergencies occurring in flight.

The importance of hypoxia has been recognized since 1875, when the balloon *Zenith*, carrying Tissandier and two companions, ascended to 28,820 feet near Paris. Tissandier alone recovered from the severe hypoxia that afflicted all three. In 1941 Graybiel² reported three deaths in flight and five additional deaths shortly after landing among seven million passengers carried by commercial airlines. The three deaths aloft, one at 3,000 feet, one at 12,000 feet, and the other at an unknown altitude as well as two of those occurring immediately following landing were attributed to heart disease.

White³ and Benson⁴ reported myocardial infarctions aloft in two young pilots which terminated fatally soon after landing. Graybiel and McFarland⁵ reported a similar instance with survival of the pilot. Commercial air travel, however, is generally regarded as a safe method of transporting the patient with a heart disease when proper precautions are taken to prevent hypoxia during flight.⁶ Marquardt and associates⁷ reported that during World War II patients with myocardial infarction in all stages of recovery, were evacuated by air transportation without incident.

In addition to infarction of the myocardium such serious pathologic entities as hemorrhagic retinitis,⁸ spontaneous pneumothorax,⁹ air embolism,¹⁰ and subarachnoid hemorrhage¹¹ have been associated with flight. It is interesting to note that both cases of hemorrhagic retinitis occurred in patients with increased blood pressure.

There are reports of similar mishaps in pressure chambers simulating high altitude flight. Hammonds¹² reported the death of a student gunner due to myocardial infarction 12 hours follow

ing a simulated flight to 38 000 feet. Some of the more important problems of adaptation of the human organism to the physiologic stress of flying have been summarized by Grant ¹²

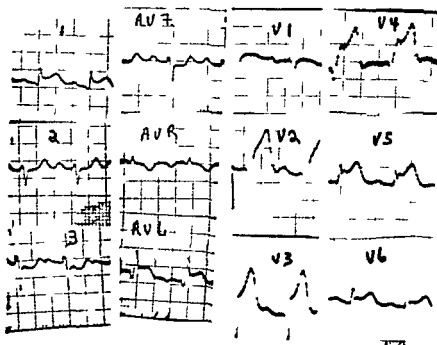


Figure 1. Electrocardiogram, 21 November 1952, hours 1 to 1.5, ST segment, V_L Lead I, V₁, V₂, V₃, V₄, V₅, V₆.

The case of a young pilot who sustained an acute anterior myocardial infarction while flying at 12 000 feet without oxygen in an unpressurized military plane and who made a satisfactory recovery from the acute attack is reported.

CASE REPORT

A 30-year-old pilot was admitted to this hospital on 21 November 1952. On a flight in a C-47 type aircraft from a distant base in Georgia the patient and his copilot decided because of unfavorable weather to increase their altitude to between 9 000 to 11 000 feet for about two hours. During the last 30 minutes of this flight they were at an altitude of 12 000 feet. The aircraft was not equipped with breathing oxygen and was unpressurized because they had not anticipated flying above 7 000 to 8 000 feet. The patient was seized suddenly with severe oppressive precordial pain which radiated into the left shoulder and down the left arm. Because of nausea a cold sweat and shortness of

breath, he turned the controls over to the copilot who landed at this base, 20 minutes after the onset of the severe pain

The patient stated that he had been in good health previously, but that his blood pressure was just under the upper limit of acceptability for military pilots (140 systolic 90 diastolic) several months before when he received an annual physical examination. This was the only cardiovascular abnormality reported prior to his admission to this hospital

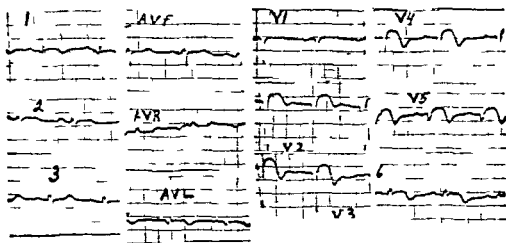


Figure 2 Electrocardiogram on 29 November 1952 revealed progressive inversion of the T wave in V_2 , V_3 , V_4 and V_5 with associated deep coving of the S-T segment and deep inversions of the T waves

On admission to the hospital the patient's blood pressure was 126/100 and his pulse 120. He appeared pale, apprehensive, short of breath, and in acute distress from the persistent chest pain. He was at once placed in an oxygen tent and given morphine. The cardiac sounds were poor in quality and sounded distant. The heart did not appear enlarged to physical examination and there were no murmurs present. The second heart sounds heard over the aortic and pulmonic areas were equal. No gallop or rub was heard. The lungs were clear to auscultation and percussion. The physical examination was otherwise negative.

An electrocardiogram taken on admission (fig 1) showed elevation of the S-T segment in aV_L . Lead I, V_1 , V_4 , and slight elevation in V_6 and V_7 . There was a sinus tachycardia at 100. The P-R interval and QRS interval were normal. A diagnosis of acute anterior myocardial infarction was thus confirmed and the patient was treated with bed rest and moderate sodium restriction. Serial electrocardiograms revealed progressive inversion of the T wave in V_1 , V_2 , V_4 , and V_5 with associated deep coving of the S-T segment and deep inversion of the T waves which changes were interpreted as compatible with the evolutionary changes of an anterior myocardial infarction (fig 2).

During the days immediately following his admission his temperature increased to 102° F and the white blood cell count and sedimentation rate which previously had been within normal limits rose with the onset of fever. These findings were interpreted as further indications of degenerating myocardium but he showed no evidence of decompensation or arrhythmia. He was treated without anticoagulant therapy and responded satisfactorily. No evidence of renal disease or other primary cause for the previous hypertension was discovered during the hospital stay. His blood pressure was 100/60 at the end of his hospitalization and his cardiac reserve was considered good. Following discharge from the hospital on 6 January 1953 he was permanently suspended from flying duties.

DISCUSSION

Blood arterial oxygen saturation progressively diminished with altitude according to Henson and associates:

<i>Feet</i>	<i>Percent</i>
Sea level	96
8 000	89
12 000	84.9
15 000	74.4
18 000	71
20 000	70.5

It is generally believed that hypoxia may be present at 8 000 feet with definite impairment of night vision. At higher altitudes the physiologic effects of hypoxia are more pronounced.

The human organism adapts to hypoxia by an increased respiratory rate with resultant decrease in arterial $p\text{CO}_2$, a temporary alkalosis, and an increase in the oxygen carrying capacity of the blood. There is an increase in cardiac output and heart rate but a decrease in circulation time. In the electrocardiogram the T waves are flattened, the QRS complex is decreased in amplitude, and there is depression of S-T segment. There is also an increase in electric systole with prolongation of Q-T interval despite an increase in pulse rate. Schneider and Truesdell⁷ have shown that with hypoxia there is an elevation of the systolic blood pressure and fall in the diastolic pressure. They also found that persons with labile blood pressure were more likely to experience vascular collapse under the stress of severe hypoxia. This may have been a factor in the case reported.

Kremerberg and Winter⁸ discussed in some detail the blood pressure response of normotensive and hypotensive subjects to

hypoxia and showed that their cardiovascular systems made adequate adjustment. They report that those who have hypertension secondary to renal or other diseases make a poor cardiovascular adjustment to increasing hypoxia, often experiencing vascular collapse at altitudes tolerated by normal persons.

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Pulmonary Arteriovenous Fistula

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PULMONARY arteriovenous fistula is a rare lesion occurring in only three of 15 000 consecutive autopsies at Johns Hopkins Hospital. It has been observed from birth to old age but is found usually in the third and fourth decades of life.

The following case is reported by us because of favorable response to surgical treatment.

CASE REPORT

A 23-year-old marine was sent to this hospital for further study when cyanosis and clubbing of his fingers and toes were noted while he was being processed for separation from service. The patient is said to have been cyanotic since birth but at no time were any cardiovascular symptoms noted. His activity had never been restricted; he had even served a 12-month tour of duty with the marines in Korea. No increase in cyanosis or clubbing of the digits had been noted in the past 10 years. About five months prior to admission to this hospital the patient developed nosebleeds and had had four such episodes for a few minutes every three or four days.

During the patient's childhood the question of heart disease was raised by his family physician on numerous occasions but none could be found. The patient never had any serious illnesses or operations.

On physical examination the patient appeared healthy except for the cyanosis of his skin and mucous membranes. The conjunctivas were injected and pink. The fundi were normal. The face and neck appeared to be bloated or edematous and multiple small hemangiomas were scattered over the trunk. The trachea was in midline. The chest cage expanded symmetrically and the lungs were resonant and clear to percussion and auscultation. A questionable murmur which sounded like a grade I type of blow with replacement of the second heart sound was audible in the left lower lung field posteriorly. The heart was not enlarged to percussion and no cardiac murmurs were audible. The aortic second sound was louder than the pulmonic. No masses or tenderness were present on abdominal examination. Per-

stasis was normal. Neurologic examination revealed no abnormal reflexes. There was cyanosis and marked clubbing of the terminal phalanges of the fingers and toes. The peripheral

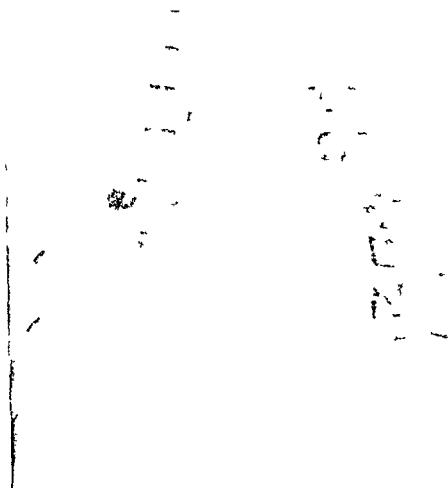


Figure 1. Angiogram showing an arteriovenous fistula in the left lower lobe of the lung.

pulses were of good quality. Blood pressure in the right arm 100/70 and in the left arm 95/60. Blood pressure in the right calf was 110/80 and in the left calf, 110/80.

The red blood cell count was 7,400,000, hemoglobin 18.2 grams per 100 cc, hematocrit, 58%, white blood cell count 6,600, with 4,480,000 platelets, 71% polymorphonuclear cells, 28% lymphocytes, and 1% eosinophils. Urinalysis negative with no albumin. Venous pressure was 120 mm Hg. Clotting time from arm to tongue with sodium citrate (dechlorin) was 14 seconds, and arm to lung with sodium citrate and ether 9 seconds. Bleeding time was 2 minutes and coagulation time, 4 minutes 45 seconds. The chest showed a cylindrical homogenous

TABLE 1 *Preoperative and postoperative data*

	P			P		
	R m —R	Hgb O—R	R m —E	Room ut—R	Room —E	
<i>Arterial blood gas</i>	CO	241 l per	3700 l p	4508 l p	4549 l per	
	O	2323 l p	2354 vol p	2076 l p	2019 l p	t
	O r ty	2784 vol pe	2784 l pe en	2158 l per	2221 vol p	
	O ur	845 pe	800 p	979 p	94 p	
	pCO	45 mm Hg	421 mm Hg	349 mm Hg	325 mm Hg	
	pO	409 mm Hg	440 mm Hg	936 mm Hg	756 mm Hg	
<i>Oxygen</i>	333 /min	322 /min	360 /m	300 /min	1210 c/m	
	0.72	0.66	0.79	0.95	0.92	
<i>Arterial</i>	530 mm Hg	68.1 mm Hg	68.2 mm Hg	207 mm Hg	403 mm Hg	

lower lobe from the hilum to the diaphragm suggestive of an arteriovenous fistula. Angiocardiography revealed an arteriovenous fistula in the left lower lobe (fig 1). Oximeter readings showed 70 percent oxygen saturation with no change on 100 percent oxygen. An electrocardiogram demonstrated minimal left ventricular hypertrophy. Preoperative gradient studies are shown in table 1.

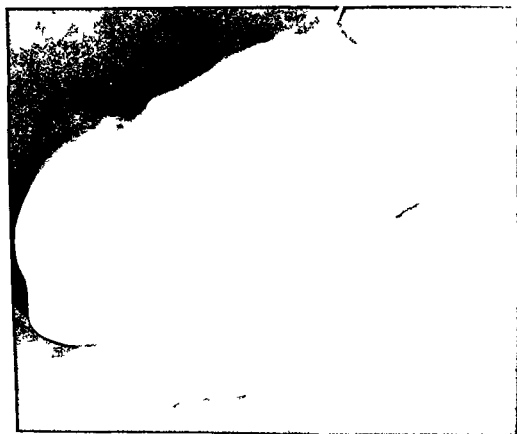


Figure 2 Roentgenogram of resected specimen showing pulmonary artery, pulmonary vein and cavernous communicating sac outlined by diiodast.

On 22 September 1953, under endotracheal ether pentothal, nitrous oxide and curare anesthesia, a left exploratory thoracotomy was performed. The chest was entered through the bed of the sixth rib. Examination of the vascular anomaly in the left lower lobe revealed an enormously dilated pulmonary artery and vein which joined a large, very thin walled sac, within which the blood could be observed circulating. A left lower lobectomy was performed, thereby extirpating the lesion (figs 2 and 3). No other lesion was found. Oxygen saturation by oximeter rose from 71 percent to 96 percent when the pulmonary artery to the left lower lobe was occluded. Postoperative gradient studies are shown in table 1.

After 30 days leave the patient was discharged to full duty. On 11 December he was readmitted for repair of a left inguinal hernia. At that time he was free of symptoms there was no cya-



Fig 3 R t d p me b w g t f t l w l b f l g w th
arterio f t la

nosis and the clubbing of his fingers was noticeably less when compared with photographs taken on his first admission to the hospital. The red blood cell count was 4 480 000 and hemoglobin was 16 4 grams (103 7 percent)

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Hypnosis in Neuromuscular Re Education

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THE advantages of hypnosis in neuromuscular re education, as far as we know, have not been previously reported. The idea for this experiment was an outgrowth of the hypothesis that in the first few years of life voluntary muscles may be bilaterally innervated, whereas it is only later that the contralateral corticospinal tracts take over voluntary function. There are suggestions in the literature which support this hypothesis, particularly in reports of animal experimentation.¹ Penfield and Rasmussen² presented several cases in humans in which there was evidence of ipsilateral innervation of muscles as shown by electrical stimulation of the cerebral cortex. Because there are cases of muscular paralysis such as hemiplegia due to the interruption of contralateral fibers in the brain it was proposed to regain motion by re establishing function of the inactive ipsilateral tracts. To accomplish this, it would be necessary to regress the patient to an early age. Thus the use of hypnosis was proposed. A relatively young patient was chosen in order to facilitate the induction of hypnosis and to reduce the number of years away from that age when voluntary muscles were presumably bilaterally controlled. This technic was used previously in two patients, with equivocal results.³

CASE REPORT

The patient was a 30 year old left handed woman who was admitted to this hospital with pulmonary tuberculosis. She was first seen by the physical medicine service on 18 January 1962, at which time routine prethoracotomy exercises were prescribed. On 31 January, a left upper lobectomy was performed. On 11 February a flaccid left hemiplegia developed suddenly as she awakened from a nap, presumably due to a cerebral embolus in the right internal capsule, the source of which was never definitely determined. There was no evidence of thrombophlebitis. It was thought that, although the time interval was atypical the source of the embolus was probably the stump of the resected lobe. At the onset the deep tendon reflexes on the left could not be obtained but within the next 24 to 48 hours the

classical findings of hyperactive deep tendon reflexes absent abdominal reflexes and Babinski sign developed on the left side. There was mild dysarthria exhibited as a slurring but there was no aphasia. No spasticity was noted. Gross muscle testing on 15 February revealed a moderate left facial weakness of the upper motor neuron type and marked weakness to complete paralysis of all musculature of the left upper and lower extremities. Passive joint range of motion was within normal limits in these extremities and no spasticity was noted. Passive exercises for all joint motions of the left upper and lower extremities and active assistive to active re-educational exercises of the few remaining functioning muscles were initiated. No improvement was noted within the next two weeks. In fact the left upper extremity became completely paralyzed. In the left lower extremity the following muscles or groups of muscles were present as trace contractions: external and internal hip rotators, iliopsoas, quadriceps and hamstrings. All other muscles in the left lower extremity were completely paralyzed. Mild flexor spasticity in the left upper extremity and mild extensor spasticity in the left lower extremity had developed.

Hypnosis was first attempted on 3 March. It was explained to the patient that the technic was a relaxing one for the twofold purpose of (1) testing muscle function under a minimum of tension and (2) accelerating the rate of recovery of muscle function. Because the patient was less alert following her cerebral accident, exhibiting an inappropriate silliness and a personality change, she was very distractible and unable to concentrate upon the suggestion of the therapist. Early attempts at hypnosis were therefore unsuccessful.

By the third attempt (5 March) the patient went into a deep trance. It was suggested that she was a few years younger. Her age level was tested initially by noting the last name married or maiden she used when questioned. Subsequently age was determined by asking her which grade of school she was attending. The patient was successfully regressed to the age of four years during which time she talked freely and cooperated with the hypnotist. However, at the regression age of two she would not talk, was negativistic and would not play the games that were suggested. Therefore the ages of three and four years were used for all subsequent exercises.

The first important phenomenon noted under hypnosis was that when ordered to throw a ball with her paralyzed arm or to kick it with her paralyzed leg, the patient complained that she could not move the extremity. She was puzzled when at all ages under hypnosis she could not form the image of bouncing a ball with her left arm, although she could with her right. After repeated

strong suggestion that she was in a period prior to her paralysis that she remembered how to move her extremities. As she was moving them in a normal manner, the patient began to have evidence of re-establishing the mental image of kicking and throwing the ball, at all age levels, with the paralyzed arm as with the unaffected side. The patient was told that she would remember throwing and kicking the ball as if it were a dream. When she was awakened from the trance and reassured that she had co-operated so well that she relaxed and went to sleep she excitedly reported to the therapist that she had dreamed she was moving all four extremities equally well. From that point she seemed to exhibit more hope and cheerfulness about the possibility of recovery.

During the next week the patient was repeatedly regressed to the age of three or four, depending on at which age she would follow the suggestion to exercise. The height to which she could kick her left leg was tested before hypnosis, after hypnosis prior to regression and finally after hypnosis with regression to an earlier age in life. It was noted that the patient could kick highest during the last mentioned period. Experiments have shown that muscle strength and endurance are increased in the normal human in the hypnotic state. She was thus exercised both passively and actively while regressed under hypnosis. By 13 March the patient was showing rather rapid return of function. In the left lower extremity the internal and external rotators of the hip were rated* 15 percent iliopsoas, 35 percent gluteus maximum, 15 percent quadriceps 50 percent thigh adductors, 15 percent hamstrings 20 percent and the gastrocnemius, 15 percent. This muscle test was done with the patient in her usual state not under hypnosis. The function under hypnosis at age four was still greater than that without hypnosis. Within the next two weeks the left pectoralis major and biceps brachii returned to voluntary function being rated 15 percent three weeks after beginning the use of hypnosis (a total of nine months). Muscle function when not under hypnosis equalled that under hypnosis. Though hypnosis was continued until the return of function curve had definitely diminished.

It had been recommended that the patient exercise during the day as she lay in bed in order to strengthen the returning muscles but she refused to do this. A posthypnotic suggestion was given that specific exercises every hour while awake. The patient could be seen to interrupt anything she

Voluntary muscle 50 percent 10 percent
25 percent full range full range 1 minute
muscle mass gravity 75 percent full range full motion
re 100 percent small

in order to exercise regularly as suggested. This posthypnotic suggestion was reinforced periodically.

Active assistive to active re education exercises for the weak muscles and resistive exercises for the antigravity muscle groups of the left upper and lower extremities were continued after cessation of hypnosis and occupational therapy was directed toward increasing coordination and strength of the affected extremities. Also in occupational therapy dominance was changed so that she became right handed. (An attempt to change dominance from her left to right side had been made at age five or six years and the patient recalls this as a rather confusing period when she was ambidextrous.) By the end of April the patient was able to ambulate with the aid of a cane and left drop foot brace. The left arm and hand had not as yet become functionally useful. A moderate degree of flexor spasticity in the left upper extremity and extensor spasticity in the left lower extremity had developed. The deep tendon reflexes on the left were still hyperactive and the left abdominal reflexes were still absent. A left Babinski was present. The mild dysarthria and left facial weakness had completely disappeared. The patient was discharged from the hospital during the last week of October at which time the pulmonary tuberculosis for which she was originally admitted was arrested. Physical therapy was continued on an outpatient basis and on 18 February 1953 voluntary muscle testing revealed the following: all muscles of the left shoulder girdle were rated from 10 to 40 percent; biceps brachii 70 percent; triceps 60 percent; long finger and thumb flexors and wrist extensors 65 percent or better; and finger extensors and hand intrinsic muscles from 0 to 45 percent. Despite the persisting paralysis of numerous intrinsic muscles she is gradually learning by substitution and improved coordination to make maximal use of the left hand so that at present she can for example turn doorknobs and faucets and is attempting to knit. In the left lower extremity all muscles were rated 50 percent or better with the following exceptions: internal and external hip rotators 35 percent; peroneus group 10 percent; and toe flexors and extensors 15 to 40 percent. She walks with a slight but typical hemiplegic gait, has very little difficulty ascending and descending stairs and at present is beginning to walk without the drop foot brace. She has been able to assume partial responsibilities for the care of her young children and to perform routine housework.

DISCUSSION

Hypnosis was used for four purposes in this case.

1. To re-establish for the patient the mental image of moving her limbs. Judging from her inability to picture herself moving while under hypnosis, not only during the current period but also after regression, there seemed to be an interruption of the associ-

ation fibers or an injury of the image area. Thus the patient was mentally "paralyzed" as well as physically.

2 To regress the patient to an age of three to four years during which her active range of motion was immediately greater than when awake. This assistive "device" thus contributed to the early attainment of active exercise. Maximum benefit from re-education under hypnotic regression was realized during the first three weeks, though the process was continued for five months. We believe that the rapidity of initial benefit from hypnosis followed by a sudden decrease suggests that some other motor tracts, for example inactive ipsilateral tracts or the extrapyramidal tracts, assumed the function of the injured contralateral pyramidal tract. The coincidence of the attempt to change dominance from the patient's left to right side at age five or six years during which period she was ambidextrous may have singled out our patient to favor reactivating ipsilateral tracts.

3 Posthypnotic suggestion was used to induce the patient to exercise regularly the returning muscles. Prior to this the patient had been lax in following an exercise routine on the ward.

4 Finally, though by no means of least importance, the psychiatrist member of this team because of his visits three times per week for hypnosis was useful in supporting and motivating the patient through her periods of hopelessness and despair, intensified by the many practical problems arising from her paralysis subsequent to hospitalization for tuberculosis. Also he helped prepare her for resumption of limited duties at home and for the care of her children.

Realizing that patients do spontaneously recover from hemiplegia due to cerebral embolus, a review of the literature as regards expected rate of recovery does not rule out the possibility that hypnosis was at least a factor in the return of muscle function which we consider was both more rapid and more complete than when routine physical therapy measures alone are used particularly in view of the progressive loss of function during the first few weeks of this patient's illness. We also believe that the combined use of hypnosis, psychotherapy, and physical and occupational therapy has resulted in a more complete rehabilitation of this person than could have been realized from the use of routine physical methods alone.

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- 2 P f Id W nd Ra muss F *The Cerebral Cortex of Man*. The Macmillan Company, New York, N.Y. 1950 pp 121-130.
- 3 Cam on R R D k H L d L c mb H B P cal mmunicat
- 4 R h, E S St gth nd dura waking d hyp t tat J A pl. *Phys L* 3 404-410 J n. 1951

Construction of a Simple Intraluminal Type Vein Stripper

THOMAS W AYRES *Captain USAF (MC)*
 HORACE W BOGGS Jr *First Lieutenant USAF (MC)*

THE treatment of varicose veins of the lower extremity has long been a perplexing problem. At present the most successful method of surgical management of varicose veins of the lower extremity is multiple saphenous ligation combined with stripping of the long saphenous segments. This method has been advocated since 1931¹ when Emerson and Muller² described a flexible vein stripper. Since that time various types of intraluminal strippers have been reported.

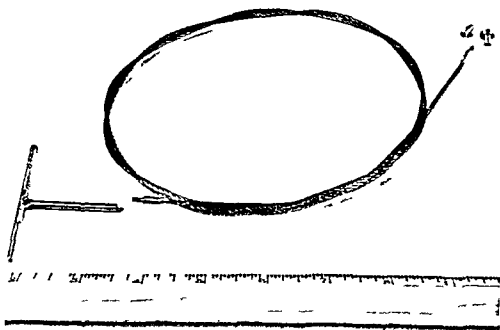


Fig. 1. A flexible intraluminal vein stripper made from materials available at Air Force bases.

This type of treatment of varicosities of the lower extremities has been limited at some Air Force hospitals because commercially produced intraluminal vein strippers are not always available through routine supply channels. The number of patients

with varicose veins suitable for combined ligation and stripping procedures who sought treatment in our surgical clinic prompted the construction of a satisfactory vein stripper (fig 1)

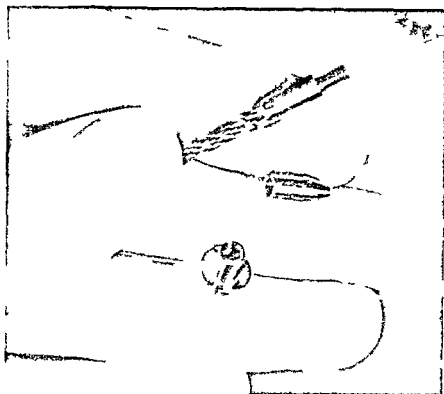


Fig 2 A detailed view of the catheter and the bulbous handle

The materials used for the construction of an intraluminal type vein stripper are available at all Air Force bases. They include the following items:

- 6500-210395 Cable corrosion resisting flexible
- 6800-456450 Steel chrome nickel corrosion resisting condition A composition G round rod 1/2 inch
- 6800-9-500 Solder silver wire class 4 1/16 inch

The cable used for aircraft control surface attachments is the strong flexible sufficiently smooth braided wire. The tips can be easily shaped on a lathe by a skilled craftsman from the one half inch rod.

The following technique is used by us. An initial incision is made parallel to and two centimeters below Poupart's ligament overlying the femoral pulsation. The long saphenous vein is

The fact that reactions did occur with other strains only serves to emphasize the necessity for careful use of cholera antisera in diagnostic procedures

CONCLUSION

An antigenic relationship between some species of paracolobactrum and certain cholera vibrios does exist. With further studies a more conclusive relationship may be demonstrated.

REFERENCE

1. Rata, L. E., and D. L. MacCallum. Cholera vibrios. *Canad. J. Pub. Health* 34: 26-37, 1943.
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TREATMENT OF PROSTATITIS

A pertinent question should be asked: should treatment of prostatitis be advised whenever found? If the patient is less than 40 years of age, treatment is usually indicated. This is an arbitrary statement of age and one should not be dogmatic about it in all cases. In general, however, it has been a satisfactory plan of attack. One factor in the decision that treatment is indicated is the nature of the patient's symptom. Certainly if significant urinary complaints such as burning and frequent urination, dysuria, and nocturia are present, treatment is indicated. Frequently aching low in the groin or low suprapubic distress may be noted. A true urethral discharge is seldom seen, unless stricture is present. Perineal pain is not a symptom of prostatitis and in uric acid excretion is usually related to a functional disorder. Too frequently this symptom with fleeting testicular distress and a watery urethral discharge usually present only after stripping the urethra will be attributed to the dental finding of prostatic stones when in all the instances they are the expression of anxiety or tension states brought about by past indiscretions or erroneous ideas concerning venereal and undry sexual complicity. It might be well to mention here that prostatitis is very responsible for psychological impotence or premature ejaculation or any of the various disturbances of the sexual function.

—EDWARD N. COOK, M.D.

Published by Staff Medical Group
May Clinic, p. 248 May 5, 1954

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J h V N ir Comdr (DC) USN	Arthur E Wh t Col MC USA

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N na M R m o Capt ANC USA	L llia B W lary 1st Lt ANC USA
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Th ma P Rus ock 1 t Lt MSC USA	W ift d R Zirkl Maj ANC USA
Eva A Savy Capt ANC USA	

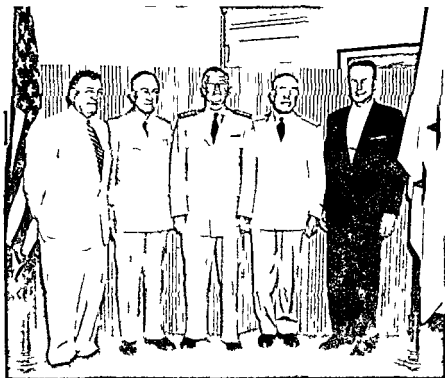
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CHIEFS OF FEDERAL DENTAL SERVICES MEET TO DISCUSS MUTUAL PROBLEMS

The chiefs of the Federal dental services met recently in Washington, D. C. as the luncheon guest of Rear Admiral Daniel W. Ryan (DC) USN Assistant Chief for Dentistry and Chief of the Dental Division of the Bureau of Medicine and Surgery to discuss informally their mutual professional interests and problems.



Left to right: Dr. John E. Fauber, Major General Oscar P. Snyder, DC USA, Rear Admiral Daniel W. Ryan (MC) USN, Brigadier General Marvin E. Kneibek USAF (DC), and Dr. John W. Knurso.

Members of the group who with Admiral Ryan comprise the top dentists in the U. S. Government included Dr. John E. Fauber, Assistant Chief Medical Director for Dentistry, Veterans Administration; Major General Oscar P. Snyder, DC USA, Assistant Surgeon General and Chief of the Dental Corps, U. S. Army; Brigadier General Marvin E. Kneibek USAF (DC), Assistant for Dental Services, Office of the Surgeon General, U. S. Air Force; and Dr. John W. Knurso, Assistant Surgeon General and Chief Dental Officer, U. S. Public Health Service.

REGULAR MEDICAL CORPS OFFICERS CERTIFIED BY SPECIALTY BOARDS

The American Board of Neurological Surgery

Since its organization in 1940, the American Board of Neurological Surgery had certified on 30 June 1953 a total of 486 physicians in this specialty, of whom the following eight are regular officers of the military services

F k B Cla Lt Comdr USN	William J J mes Comdr USN
William H Dr ck mill r Comdr USN	W rre H K msey Lt Col USA
Richa d W Garr ty Capt USN	J h Martin Col USA
Ge rg J Hay s Lt Col USA	Arthur L Schultz Comdr USN

The American Board of Plastic Surgery

The following six officers of the regular Medical Corps are certified by the American Board of Plastic Surgery which was activated in 1937 and, on 30 June 1953 had certified 275 physicians

J ph R C lly Comd USN	L o E P tter Capt USN
J me Crawford Comd USN	B rnard N Sod rberg C I USA
Hal B J n ng Jr Lt Col USA	W lfr d T Tumbusch Lt Col USA

The American Board of Proctology

Most recently activated of the official specialty groups, the American Board of Proctology from 1949 until 30 June 1953 certified 144 physicians including the following regular officer

Ge rge M Ly h Comdr USN

The Board of Thoracic Surgery

The Board of Thoracic Surgery, an affiliate of the American Board of Surgery, was established in 1948. Of its 397 diplomates, on 30 June 1953 who must first be certified by the parent board, the following five physicians are regular Medical Corps officers

Mar L Co rly Comdr USN	John M Saly r C I USA
J m H F Col USA	Cl fford F Stor y Capt USN
Jos ph M Ha r Capt USN	

This is the third of a series of lists of officers certified by the American Board of Physical Medicine and Rehabilitation which will be published in the November 1953 issue.

MILITARY DENTISTS TO SPEAK AT ANNUAL A D A MEETING IN MIAMI 8 11 NOV

More than 30 officers of the Army Navy and Air Force medical services will participate in the scientific program of the ninety fifth annual meeting of the American Dental Association in Miami Fla 8 9 10 and 11 November 1954 Colonel Jack B Caldwell DC USA Letterman Army Hospital San Francisco is chairman of the Section on Oral Surgery and Anesthesia and Lieutenant Henry M Tanner (DC) USN U S Naval Dental School Bethesda Md heads the Section on Operative Dentistry

The scientific exhibits include a presentation of surgical anomalies and procedures prepared by Lieutenant Colonel Walter H Becker DC USA Fort Sheridan Ill

Speakers on the scientific program include the following officers

9 November

B Pb menol gy f N l E pl —L C l Ge ld M M D I
MC USA W l R d Army H p tal W h gt D C

T g f D t t Sp l d T tm t—Lt C l Cur P Ar MC
USA B k A my M d cal C Sa A T

F tor l flue g th C tt g Ch t r t f R t t g D t l Inst
m t —Col Donald C Hud USAF (DC) N o l Bur f Sta d d
W h gto D C

Sel t nd U f R t t g D tal Ctt g Inst um t (m t p tur)
—Maj J k L Ha l y USAF (DC) N t l Bur f S d d W h
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Progr R port Ult D t try—C mdr Ar G N l (DC)
USN N io l N l M d l C ter B th d Md

R g st t of C t and P t us e R la sh p—Lt C l Edw H
Sm h j DC, USA W lt R d Army M d l C nt W shingt D C

F ll S rv th Pro thod t t Shouldr de C plasty—Capt Al n
H G un wald (DC) USN U S N l T ing C G L k Ill

E th t c A t B dg P sthod nt s—L Col Ge g H M l
DC USA B ook Army M d l Ce te S A on T

10 November

D l mma D t M t t r v l ff cy f Am Y th—C pt
Harry E D ne (DC) USN U S N l H p tal Ch l M

Maxillary Sinus in Relation to Extension of Teeth—Col Lowell E McKeley
DC, USA Brooke Army Medical Center San Antonio Tex

Rebuilding the Resorbed Alveolar Ridge—Comdr Clarence H Blackstone
(DC) USN National Naval Medical Center Bethesda Md

The following table clinics will be given by Dental Corps officers

Improved Speech in Complete Denture Construction—Lt Col Leslie R Allen USAF (DC) Randolph Air Force Base Tex

Open and Closed Methods for Reduction and Fixation of Fractured Facial Bones—Lt Col Walter H Becker DC USA Ft. Sheridan Ill

Supero-orbital Dental Implants—Col Roy L Bodine Jr DC USA Camp Gordon Ga

Impression Technique for Complete Dentures—Lt Col Allan A Bewer USAF (DC) March Air Force Base Calif

Clinical Effect of X-Radiation on Normal Oral Tissues—Lt Col George W Burnett DC USA Walter Reed Army Medical Center Washington DC

Temporomandibular Joint Roentgenography—1st Lt Byron G Butt USAF (DC) Randolph Air Force Base Tex

Replacement of Tissue Surface in Complete and Partial Dentures—Major Sebastian J Campaign DC USA Walter Reed Army Medical Center Washington DC

Clinical Effect Obtained With Immediate Complete Dentures—Lt Comdr Richard G Coope (DC) USN Marine Corps Recruiting Depot Parris Island S C

Extraction of Simple and Complicated Impacted Teeth Using Local Anesthetics—Major George D Dwyer USAF (DC) Keesler Air Force Base Miss

Antibacterial Resins—Col Theodore E Fisher USAF (DC) Randolph Air Force Base Tex

Diet Method of Preparing the Quartermaster—Major Emmett J Folger USAF (DC) Sheppard Air Force Base Tex

Rational Techniques in Endodontic Treatment—Lt Comdr Warren J Hedema Jr (DC) USN National Naval Medical Center Bethesda Md

Recognition of Incipient Periodontal Disease—Comdr Sam Stone Holme (DC) USN National Naval Medical Center Bethesda Md

Procedures and Administration in Dentistry for Children—Major Daniel G Kirel DC, USA Walter Reed Army Medical Center Washington DC

Importance of the Recovery of the Denture Bearing Tissues in Impression Making—Comdr Robert B Lytle (DC) USN National Naval Medical Center Bethesda Md

Partial Denture Prostheses for the Young Inductee—Lt Col Charles D Parr USAF (DC) Chanute Air Force Base Ill

B p y T b / t h G n e l P r a t t —C l R b e r t B S h i r a D C U S A
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N t l N a v a l M e d i c a l C B t h d M d

M n a g m e t f l f t / t h H a d d N k / D t l O g —L t D l
V m (D C) U S N U S N l H p t a l Y k u k J p

A l v l p l s t P r o d u r U d I m m e d t D t u r P t h —C a p t.
S h m B W o n U S A F (D C) K r t l d A i r F B N M

DEATHS

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A MESSAGE FROM THE A M A

During the Second Session of the Eighty Third Congress which adjourned 20 August 1954, a number of laws of interest to members of the medical profession were enacted. Because physicians on active duty in the armed services may not have ready access to information in this connection a brief summary is presented here.

Hospital Construction A bill providing for expansion of the "Hill Burton" hospital construction program was enacted (P L 482, 83d Congress). In brief it provides for grants to the states for construction of hospitals for the chronically ill, nursing homes, rehabilitation centers and diagnostic treatment centers.

About \$23 million has been appropriated to carry out this law for the next fiscal year allocated as follows: \$6.5 million for hospitals for the chronically ill, \$6.5 million for diagnostic treatment centers, \$4 million for nursing homes, \$4 million for rehabilitation centers and \$2 million for state surveys.

Vocational Rehabilitation A law designed to greatly expand programs for vocational rehabilitation (P L 565, 83d Congress) includes provisions: (1) authorizing matching grants to the states in increasing amounts from \$30 million for fiscal 1955 to \$65 million for fiscal 1958; (2) establishing a National Advisory Council on Vocational Rehabilitation to advise the Secretary of Health, Education and Welfare on special projects; (3) changing the formula for federal contribution to one varying inversely with per capita income; (4) authorizing 75 percent federal grants for "extension and improvement" of state rehabilitation projects for up to three years with \$5,000 per state minimum; (5) authorizing a demonstration rehabilitation center in the Washington D C area; and (6) enlarging provisions granting blind persons preference for operating vending machines on federal property.

Doctor Draft Law S 3096 (P L 403, 83d Congress), which proposed an amendment to the Doctor Draft Law, authorizes the Department of Defense to use doctors in an enlisted status thus removing the requirement relative to commissioning in security cases.

Tax Bill The Internal Revenue Code of 1954 (P L 591, 83d Congress approved 16 August 1954) includes two provisions of particular interest to the medical profession:

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(1) *Medical expense deductions* Taxpayers under the new bill will be allowed to deduct medical expenses in excess of three percent of adjusted gross income (formerly five percent) with a maximum deduction for single persons of \$2 500 (formerly \$1 250) and a maximum deduction on a joint return of \$10 000 (formerly \$5 000) The cost of drugs is not included in the medical deduction but can be counted as a deduction to the extent that they exceed one percent of adjusted gross income

(2) *Health and accident insurance* Employer financed accident and health benefits are fully exempt if they represent reimbursement for actual medical expenses (under former law some employer type benefits not exempt) but such benefits are taxable over \$100 if they are compensation for loss of wages under either an insured or noninsured plan

Extension of Social Security A bill providing various amendments to the Social Security Act extends the coverage and increased contributions and benefit payments It does *not* include the coverage of physicians under the Old Age and Survivors Insurance provision of the Act although it does include the objectionable waiver of premium provision for permanent and total disability

National Fund for Medical Education This bill authorizes a federal charter for the National Fund for Medical Education Under this law the corporation's membership consists of a large group of leaders in business government and the professions Four doctors are included on the board of directors

Transfer of Indian Hospitals to USPHS This bill (H R 303) effective on 1 July 1955 transfers the administration of health services for Indians and the operation of Indian hospitals from the Department of the Interior to the U S Public Health Service in the Department of Health Education and Welfare (P L 568 83d Congress)

It wasn't fear of the hazards that actuated Columbus Magellan De Gama the Wright brothers Lindbergh Ernie Pyle and Leonard Wood The grave and curse of mankind is his instinctive acceptance of the concept It Can't Happen To Me Really indeed is the soldier who expects to be shot by the enemy He's going to be the enemy

—LOUIS J BAILEY M D

D i t M d I N w

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CORRESPONDENCE

To the Editor —What a happy thought publish ng Sir Will m Osler
Th Army Surgeon n your M rch issue It i most entertaining to
r d nd is a m gnificent express n of Engl h, t uching on all the
a pects which hav confronted young medical men j ning the s rvices

It i a great p lge to r d wh t is actually typ of cl sic in
t w y n these days of a mo e precise and less colorful diction
wh ch our mechanical age forc us into u ig We feel t is well
worth bring ng to the tice of all med cal off cers and I think this
mght as a l t r y treat a d a a purveyor of the practical ppr ch
to p oblem be of lue

C ngratulations on th *Journal* wh ch we all read with interest here

A V c M hal E A DALEY
Dir t G eral f N d l Se
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BOOK REVIEWS

CARDIOVASCULAR SURGERY by *Gerald H. Pratt* M. D. 843 pages 358 illustrations on 261 figures and 4 plates in color Lea & Febiger Philadelphia Pa 1954 Price \$15

Advances in the field of cardiovascular surgery are taking place today perhaps with greater rapidity than in any other surgical specialty if not in the entire field of medicine. This suggests the difficulty faced by an author who attempts to write an up-to-date text covering a subject for which new diagnostic and therapeutic techniques are announced almost weekly. Doctor Pratt has undertaken this enormous task and in general his efforts have been remarkably successful. Within the covers of this one book practically all cardiovascular surgical conditions are discussed from the standpoint of etiology pathology diagnosis and treatment. An outstanding omission is the lack of due reference to intracranial aneurysms and vascular malformations an important and not uncommon group of vascular surgical lesions.

The rapid changes which are taking place in the diagnosis and treatment of congenital and acquired heart lesions make this subject a difficult one but the author has covered it well in the volume's nine sections. It would be impracticable or impossible to include all diagnostic measures and operative procedures which have been advocated for these lesions but most of those whose worth has been proved are included. The diagnosis and repair of septal defects and of chronic constrictive pericarditis are two subjects that could well have been discussed in greater detail.

The two sections on the arterial and venous systems are the meat of this book. The general context is similar to that of *Surgical Management of Vascular Diseases* a book by the same author that appeared in 1949 but it has been extensively edited or completely rewritten and much new material added. These subjects are dealt with clearly comprehensively and authoritatively.

Despite its over all merit certain minor criticisms may be leveled at this work. It contains considerable repetition a fact that is naturally much more apparent to a reviewer who reads the book from cover to cover than it will be to one who uses it for reference. Nevertheless had repetition been kept to a minimum a briefer more compact book containing essentially all of the material in this volume could have been produced. A more thorough job of proofreading would have eliminated errors in punctuation and spelling particularly of proper names.

These occur with distressing frequency and include Collins (Collens) Wagensteen (Wangensteen) Sustinsky (Satinsky) Jarnszewski (Jaruszewski) Lillie (Lillie) Valpeau (Velpeau) Pott Perc (Sir Percival Pott) and Meier (Maier)

This book is well illustrated and the drawings are generally excellent. Unfortunately some of the photographs of gross specimens and operative procedures do not illustrate clearly the point intended. A valuable feature of this text is the complete bibliography at the end of each chapter and a well arranged index.

The relatively unimportant fault of this book to which some reference has been made does not seriously detract from its value. It is an excellent and up-to-date book and is highly recommended as a reference work on cardiovascular surgery. Although it will probably prove to be of greatest value to general surgeons interested in vascular disease this book will make an important addition to the library of all members of the profession who are interested in the subject with which it deals.

—CLIFFORD F. STOREY, Capt (MC) USN

MANUAL OF CLINICAL MYCOLOGY by N. M. F. C. N. T. Ph. D. D. d. T. H. Smith M. D. R. G. D. B. K. M. D. J. P. L. M. C. H. u. y. M. D. d. D. nald Stov. M. T. N. M. D. 2d d. n. 456 p. g. H. tra d. W. B. Sa. d. C. Ph. I. d. lph. P. 1954 P. \$6.50

This second edition brings up to date the Manual of Clinical Mycology which was first published under the auspices of the National Research Council during World War II. The original volume proved so popular that it went out of print in the early 1950's and the constant demand resulted in this new edition.

If the mycoses considered are divided into three large classes—superficial, intermediate and deep—it can be said that this manual is the best available source of information about them. In the discussion of the deep mycoses each disease is covered in detail with excellent illustrations and a summary of the findings of the work done in other countries. The references are complete and the style good. If any criticism of this section is justifiable it is that insufficient detail is given to the place of the stilbamidone in therapy.

The intermediate mycoses are also presented in a manner which leaves very little to be desired. The illustrations are as good as can be expected without the use of color. The text has some shortcomings however in the section on the superficial mycoses. In relation to the number of cases seen by the practicing physician it seems that more space and detail should be devoted to such diseases as tinea capitis and dermatophytosis of hands and feet. The section on the treatment of the superficial fungus diseases is weak in regard to such details as to which medication is preferable, what to expect clinically while under treatment and length of time required for results. In discussing tinea versicolor this text like most others states that the lesions flourish

under Wood's ultraviolet light. Such fluorescence is the exception rather than the rule and many diagnoses would be missed if fluorescence were sought for in each case.

The inclusion of the synonyms of each disease is an especially valuable feature for those medical officers who often see some of these conditions in another part of the world under such names as Gogo and Busse-Buschke disease. The very adequate formulary which is included in the appendix will prove useful to all using the text.

This manual should occupy a "front and center" spot on the book shelf of military medical officers. It is must reading for all in the field of dermatology.—WAYNE WRIGHT Lt (MC) USA

THE TECHNIQUE OF PSYCHOTHERAPY by Lewis R. Wolberg M.D. 869
page Grune & Stratton Inc. New York N.Y. 1954 P \$14.75

Considering the many volumes published yearly on psychiatric subjects, books which approach the problem of psychotherapy in a systematic way are somewhat of a rarity. The majority usually present the subject from the viewpoint of the author or the school that he represents. This volume is unusual in that the author attempts a comprehensive examination of those factors that can be extracted from any sound therapeutic situation irrespective of the specific kind of psychotherapy done and without reference to the individual style of the therapist.

The 53 chapters are grouped under five main sections dealing with the general principles of psychotherapy, the beginning phase, the middle phase, the terminal phase, and special aspects of psychotherapy. The principles discussed are supported by numerous well-chosen illustrative recordings of actual therapy sessions. In addition, there is a complete case history consisting of about 100 pages of dialogue recorded from the treatment hours. There are 481 references cited, and in addition there is an adequate recommended reading list on the various types of psychotherapy and related subjects.

The beginner in psychotherapy will find this book of great value. It is also an excellent addition to any psychiatrist's library. The chapter on "who can do psychotherapy" is quite provocative and very succinctly presents the problem of the psychiatrist's relationship to the clinical psychologist and the psychiatric social worker. The novice will also find the chapters on "answering questions patients ask about therapy" and "questions therapists ask about psychotherapy stimulating."

The adherents of various formal schools of psychotherapy could possibly criticize this volume for overemphasizing the interpersonal aspects of therapy at the expense of the intrapsychic. An eclectic approach such as this, however, which attempts to present validated techniques and procedures extracted from the different schools of psy-

ch at y psy hology and th oth r social science wo ld become utterly ncompreh nsible if the v rious the s of intr p ychic mech nisms were give as much import nce a the tech ics discussed The author has been succ ssful in wr ting textbook on th techn cs of ther py wh ch will be of definite value to th stud nt irr specti e of hi the retic b ckgr und or his adherence to a y school of therapy

—EDWARD J FOLLAR J Maj USAF (MC)

CLINICAL PSYCHIATRY f r Pra t t d S d t by I Sk ttow
M D 395 p g M Graw H ll B k C I N w Y k N Y 1954
P \$8 75

Th s excellently written practic l treati s on the pr ctice of p y ch i try is directed to general p actitioners and medic l students At t ntion n the early chapters is focused on the int gration of psycho logic somatic and soci l facto s n th study of health and sickness a whole The sect o s following e devo ed to c se histo y taking and princ pl s of treatm nt The la t half of the bo kg ves fin ly drawn descripti ons of the va iou clinical st te with pertinent suggesti on for man gement of each Throughout the style s viv d th d scrip tion are accurate nd th p tient as person i emphasized

B c u th s b k i by Engli h physic i n pract cing in Great Br tai sev ral vari ti ns fr m Americ n practice are noted The di gno tic nomen lature ncl d s ch ent ti s schizophrenoid st tes nd paraphrenia not c mmonly used n thi country It was startling to this exami r to f nd that p ychoanalysis as a method f t tment is given n more sp c tha occupat onal therapy

The book i well printed and d sig ed n n ea y to read typ but the b bliogr phy eems somewh t inadequate It s recommend d for rading by students nd medic l officers who seek gud nce in th many p ychiatric problem they encounter n their d y to day work

—FELIX H OCKO C pt (MC) USN

PSYCHOPHYSIOLOGIC MEDICINE by E g Z k ma M D 370 pag
L & F b ge Ph l d lph P 1954 P \$7

Thi book s w tten prima ily for the physician who i not special iz ng n psychiatry It s n t a text of p ycho omatic medicine rather it is gener lly concerned with those psychiatric facto s inv led in any illness Mor spec fic lly t considers the psychophysic logic aspects of psych atric illness med ated through the autonomic ner ous syst m

Divided into two gener l part the first portion undert kes a review of tho e methods used to elucid te the p ychiatric f ctors inv led in any illness Included h re re sections cont ing specific technics nd suggestions for sh rt term superfic al psychotherapy The second part of the volume s a review of the background origins and current thought in the various schools of modern dynam c psychiatry The

last chapter entitled Diseases Commonly Called Psychosomatic is a brief review of some of the causative problems of such common diseases as peptic ulcer asthma and hypertension The author's conclusions are cautious and restrained

Dr Ziskind who heads a psychiatric clinic in a general hospital is not an advocate of any one particular school of psychiatric thinking instead his viewpoint is eclectic and practical He emphasizes that psychiatric factors in illness are amenable to psychotherapeutic techniques on a short term basis He believes that the nonspecialist willing to devote the extra time may achieve worthwhile results with his patients

This book may be useful to any physician interested in applying himself in the areas outlined The medical student intern and resident in other specialties may find the principles of interview techniques helpful Perhaps some of the author's enthusiasm for his subject will rub off on (and fortify) the physician who is wary of his patient's psyche —MERVYN SHOR *Comdr (MC) USN*

A MANUAL ON CARDIAC RESUSCITATION by Robert M Hosler M D 183 pages illustrated Charles C Thomas Publisher Springfield Ill 1954 Price \$4

This timely book should be read thoroughly by all physicians responsible for the management of surgical patients Well written concise and to the point it clearly describes the treatment of cardiac arrest Stress is placed on the early recognition of this condition and that action must be immediate A previous properly developed reflex maneuver by the surgeon should become so automatic that it will result in action without error The importance of differentiating between cardiac standstill and ventricular fibrillation is emphasized and the proper steps to follow in both instances are accurately described The various causes of cardiac arrest are discussed as well as preventive measures which should be taken at all times

An excellent chapter on The Danger Signals of Cardiac Arrest written by an anesthesiologist is especially valuable The preparation of resuscitation kits and the necessary drugs that should be available is adequately discussed and a brief description of the defibrillating machine and the value of a mechanical respirator are included

A step-by-step program is outlined for the reestablishment of the oxygen system and for the restoration of the heartbeat In a logical sequence these steps should become automatic to all operating teams Various methods of cardiac massage are described in sufficient detail to properly combat this grave situation The postoperative management is briefly summarized in similar fashion This small volume contains all of the important factors that should be known to correct this serious surgical complication —RALPH E BROWN Jr *Major MC, USA*

ATLAS OF ORTHOPEDIC TRACTION PROCEDURES by C I S d
 M D Ph D 230 p g 124 ill st t Th C V M by Co
 St L M 1954 P \$12 50

This 230 page atl s d p cts by word and illu tration the procedure for traction commonly employed in handling o thopedic nd fr cturc pat ents wh rever counter d The c mp lat on of such data as thi between one set of covers has never before to my knowledge been sat sf ct ily accompli h d The mass of d tal nd variability of different traction technics pr cticed in v rious parts of th world h s resulted in a welter of po yms which are difficult fo the stude t nte n re ident and orthopedic assistant to master In thi volume Dr Scuderi has handled th s problem sat sf ct ily by giving d tailed instruct ons a d illu trations of the common traction procedures Under e ch particular type of procedure he h s l st d the indicat ons th tems required for th application of the traction nd h s det iled c mm nts

Inasmuch as the pr per mai ten nce of traction requires con tant nur ing nd tech ical management this bo k will be an nv luable a d to tho e entrusted with the car of rec iv ng tract on p tients nd for the nstruct on of attendants Beg nning with a description of the ba c requ rements fo h sp tal tr ction quipment the tlas conta i nfo m ti conc rning th c r of the sk n of the p tient nd a de script on of hospital bed as w ll as of th v rious types of mattresse overhead frames and th r pe nament pats of the arm mentar um It then t kes up one by oe the popul r m thods in traction ranging all the way fr m B ck kn tract on to k letal tract on by means f skull tongs for i jurie to th c rv c l a

Thr ough ut th s tlas o of the most strik ng fe tures is the cl rity of th illu strati e material These are mainly photographic type but where for emphas s d agrammatic rep ese tat ons re us d they are m larly well prep d and fully xpl natory Wh le there mav be some mi or variatio pr cticed in differ nt inst tutio s certa ly n one c n f nd serious f ult with the ubject matter r its mode f pres entat on The latte so clear th t medic l personnel not ordin rily connect d with traction management could in an emergency ly n t in the appl cati of th ndicated procedure Its very av ailability hould le en the nc denc of poor tr ctio n—or worse no tr ct on for lack of kn w how It eem ce tain that thi vol me will hortly become a tandard f renc work a a labl in ll orthopedic ward and plast r rooms —CHALMERS R GARR Capt (MC) USN

RH HR BLOOD TYPES by A l xand S W n M D 763 pag ll tra d
 Gru & S ra I N w Y k N Y 1954 P \$11 50

In th s volum Doct r W ene codiscoverer of the Rh f cto h s pres nted chronologi ally collecti n of the represent tive d most sign f c t contrib tions t the s bject i clud ng the s urc materi l

in this complex and fascinating field from which the conclusions were drawn. Included in the volume are 84 papers under the headings of historical background, fundamental observations, pathogenesis of erythroblastosis fetalis, Rh antibodies, Rh Hr types and their heredity, nomenclature of the Rh Hr types, anthropologic aspects, erythroblastosis fetalis and exchange transfusion, the MNS blood types, medico-legal applications, ABO incompatibility in pregnancy, autoantibodies and disease, blood transfusion, fundamental principles and technique of tests.

The articles describe the role of the Rh factor in the pathogenesis of erythroblastosis fetalis and the use of exchange transfusions for the treatment of the disease. They also discuss the immunologic mechanisms involved in acquired hemolytic anemia. Of unusual interest are the significant and wide applications of the Rh Hr types in anthropology in general immunology studies and in disputed paternity proceedings.

The author writes in an enviable, pleasant style. His own interest and enthusiasm in the subject leads one to believe it is less complex than it is. The volume is beautifully printed. It has an extensive author and subject index, as well as bibliography. No other writer could have written with more authority on this subject. This volume will serve as an excellent reference work for hematologists and immunohematologists; it should be in the library of all those charged with the operation of blood banks and with the instruction of blood bank personnel. It also will be a welcome reference for members of the legal profession who occasionally deal with problems of disputed parentage.

—GIOCONDA R. SARANIERO, Lt. Comd. (MC) USN

THE MEGALOBlastic ANAEMIAS by L. J. Davis, M.D. and Alexander Brown, M.D. 113 pages, illustrated. Charles C. Thomas, Publisher, Springfield, Ill. 1953. Price \$4.50.

This book was written in response to an invitation to compile a small monograph on megaloblastic anemias for the general physician rather than the hematologist. In this endeavor the authors have very competently succeeded in compiling a short but comprehensive account of the megaloblastic anemias. The subject is covered under the general headings of concepts, therapeutic preparations, Addisonian pernicious anemia, non-Addisonian megaloblastic anemias, diagnosis, therapy and references. An excellent index is included.

Especially complete is the chapter on non-Addisonian megaloblastic anemias. All possible disease entities associated with megaloblastic anemia are discussed. With excellent judgment, much of the controversial and technical minutiae have been omitted. The material presented can be readily understood and used by the general physician and nonhematologist internist and should serve a very valuable function in elucidating and clarifying the megaloblastic anemias.

—DAVID L. DEUTSCH, Lt. Col., MC USA

SURGICAL INFECTIONS by *Edw J P l k L t na t C l l Med cal*
C p U t d St t A my 332 pag s 10 il trat Cha l C
Th ma P bl h Sp gf ld Ill 1954 P \$7.75

This monograph of 332 page is divided into two parts the first covering antibiotic therapy and the second dealing with the management of surgical infection. Although the author begins the work by describing antibiotics their history use and results he drifts readily into the discussion of surgical principles and practices. In a concise manner he shows that antibiotic medication is an adjunct therapy and not a substitute for sound surgical measures. The value of antibiotics is stressed but their importance in the management of surgical infections is in conjunction with sound surgical principles.

The first section on antibiotics describes the various agents and their properties use dosage method of administration and possible results. The second section on the management of surgical infection includes a concise but thorough discussion of specific infection regarding infection and wounds involving all parts of the body including chest central nervous system and abdomen. There is also a practical and organized approach to the treatment of burn in which the author must have had a considerable experience.

In this busy routine of a physician's life it is difficult to keep abreast of all the latest research and findings relative to the therapeutic use of antibiotics because of the multitude of articles published in this journal. This monograph gives an opportunity for every doctor to acquaint himself with the latest developments and methods of use. Each chapter and the appendices supplies a large list of references for any further reading and study is desired. Although further research undoubtedly will change and add to the present knowledge of antibiotics this monograph presents today's knowledge of antibiotics and legates them to their proper position in the treatment of surgical infection — JOSEPH M HANNER Capt (MC) USN

THE YEAR BOOK OF THE EYE EAR NOSE AND THROAT (1953-1954)
Year Book Section edited by D r r k V l M D and J bn R L nd y
M D 455 p g il t t d Th Year Book P bl h Ch g Ill
1954 P e \$6

This new edition of this well known and invaluable volume seems better than the last. It would appear that the time is at hand however to separate the two specialties and establish one yearbook for ophthalmology alone and another for otolaryngology. The worth of such work depends largely on the editor who in addition to selecting from the voluminous and diverse literature on the subject also may exercise his right of inserting frequent editor's notes which in this volume are practical pertinent and at times almost brilliant.

The section devoted to the eye consists of 252 pages of information carefully culled from the literature. Sections devoted to the ear and to the nose and throat totaling 188 pages are revelations to

those who may consider ophthalmology a decadent specialty. Even a casual reading of these sections indicates clearly that this specialty is more scientific and has more unexplored horizons than our predecessors ever dreamed of.

Particularly commendable is the organization of information within each section, for example in the section on the eye it starts with diseases and abnormalities of the orbit per se then continues in an orderly fashion through each of the structures of the eye itself and concludes with surgery and therapy of the eye in general. In the aural section anatomy and testing of hearing and vestibular function are clearly enumerated. A succinct presentation of recruitment is available for the student.

Even assuming that the majority of men in these fields are familiar with the pertinent literature in their specialty this book is of value if only because of the chapter entitled Miscellaneous. Here one finds material which is fascinating reading and of practical application. Certainly all physicians even those highly specialized should be aware of the condition of cardiac arrest. This work is a must for those who are active in these specialties and yet it is sufficiently broad in scope for the general practitioner and the medical student.

—HENRY G. BULLWINKEL, *Col L (MC) USA*

PERIMETRY by Joshua Zuckerman, M.D. 391 pages with 156 illustrations
J. B. Lippincott Co., Philadelphia Pa., 1954

This new textbook covers the subject of perimetry in a thorough and adequate manner and is an excellent interpretation of procedures and clinical evaluation of pathologic conditions in the visual fields. It is detailed enough for the experienced ophthalmologist and yet not too complex or technical for the beginning student to understand.

The book covers the entire subject of perimetry. It is divided into three parts: the language and vocabulary of perimetry for the benefit of the beginner; the various methods of examination; the equipment used in examination of the visual fields; the anatomy and physiology of the visual pathway and the normal fields of vision including the field findings in various pathologic conditions; and a review of the entire subject which also includes supplementary data such as pitfalls in perimetry, mathematical aids in perimetry and a fairly complete bibliography.

This book should be of interest not only to the ophthalmologist but also to the neurologist, neurosurgeon and internist. It correlates the perimetric findings with other physical data obtained by internists and neurologists and is of assistance in diagnosing disease of the brain and in many general medical conditions which have visual field changes. It should be part of the library of every ophthalmologist.

—JESSE H. SUTTOR, *Comdr (MC) USA*

NURSING IN CLINICAL MEDICINE by J Ius J Ph D (M d n)
 d D b h M lurg J n, M. A R N 4 h d t 897 p ge
 Il t t d Th Ma m ll Co N w Y k N Y 1954

Instruct rs in nurs ng should welcome this up-to-date t xtbo k thro gh which the tude t can be quickly o iented to the scope of the subj ct. The authors have devoted the first two parts of thi bo k to b ckgr und information and to the development of med c ne as a science. The general classification of diseases with their definitions h uld prove most helpful a an ntroduction to clinical m d cine. The chapter devoted to the h alth t am is particularly well pre e ted nd timely.

Part III presents a modified systemic approach to the study of med ical nursing. Prevention rehab l t ion and psychosomatic aspects of each di ease s well as the clinical aspects of nursing re i cluded in the general discussion. The questions and study pr jects for each unit together with the exten ive and up-to-date b bliograph es should b helpful to students s w ll as nstructors.

This v lume should help the tudent in nur ing to develop po sitive attitudes toward health to comp hend the need for underst ding ach p tient in relation to his illness and thus t achieve her ob jectives in th area of clinical medic i e.

—EILEEN FITZGERALD M I ANC USA

THE YEAR BOOK OF DERMATOLOGY AND SYPHILOLOGY (1953 1954 Y
 B k Se) d t d by Ma B S lzb g M D d Rudolf L
 Ba M D 456 pag llus ra d Th Y B k P bl h In
 Ch cag Ill 1954 P \$6

This ew edition co t i s abstr ct of articles relating to d rma tology and syphilology from medi al journal rec ived f om December 1952 through November 1953. It i divid ed into 11 s ct ons on gener l dermatologic subjects (one is by the editors on Som Ad ances n Dermatologic Man gement) which gro p the selected article into broad c tegories and conta ns subj ct and author i dex for tho ntere t d in specific articles.

Although the ed tors p l gize for the omission of many worth whil d mport nt articles by their el ction they ha e attempted to p s nt the year s most outstandi g contributions to derm tolog c lit ra tur. In som nstance th articl seem to h ve been l cted in an arbitrary manner because other worth-while papers on the s me subject were om tt d. Regardless of th s the pre ent volume continues the high standard established in p ev ous years.

Of greatest value is the edito s re i w of advances n dermatologic management written as a gu de fo the gen ral pract tio er. In addition ucc nct editorial comment and cr ticism of the abstracts rev l the broad knowledge possessed by th editors. These critic sm are n

themselves worth the price of the book. This book enables the general practitioner and general medical military officer to manage the common skin diseases in a conservative and optimum manner. It belongs in the library of all dermatologists, students of dermatology, general practitioners, and medical military officers. Doctors Sulzberger and Baer should again be commended for their efforts in compiling a history of contemporary dermatology.—ROBERT E. LYONS Col. USAF (MC)

FIFTY YEARS OF MEDICINE by Lord Horder M.D. 70 pages Philosophical Library Inc. New York N.Y. 1954 Price \$2.50

Lord Horder, one of the most distinguished clinicians of our time, became a physician in 1896, one year after Roentgen announced the discovery of the x-ray. This little book contains three lectures delivered in December 1952 at the Royal Institute of Public Health and Hygiene in London in which the author reviews the progress in medicine he has seen in more than half a century.

The first fundamental change was the rise of clinical pathology, or as the writer expressed it, the taking of the laboratory to the bedside. Increased accuracy of diagnosis was the immediate result. Accounts are given of the progress in preventive medicine, chemotherapy, endocrinology, and cardiology, and of the advances in surgery, physical medicine, nutrition, and nursing. Perhaps the most interesting observations are those in the last lecture dealing with the possible future direction of medicine. The author points to the virtual disappearance of diseases such as chlorosis and scurvy, while many new conditions have been described. Some of these latter have been created by the injudicious use of new drugs and diets, and by excessive exposure to sunlight. Future fields for medical advances mentioned are eugenics, control of conception, noise abatement, voluntary euthanasia, and the medical care of the civilian population in war. The broad and philosophical approach makes the book of value to the medical man and well worth the short time it takes to read it.

—LOUIS H. PODDIS Capt. (MC) USN (Ret.)

DISEASES OF THE LIVER by Mitchell A. Spilberg M.D. 646 pages illustrated Grune & Stratton Inc. New York N.Y. 1954

This volume is one of the most significant medical books published in recent months. Our present knowledge of the liver, and particularly some gaps in our knowledge, are presented in a most readable manner from the clinician's point of view. The chapters on laboratory tests, differential diagnosis of jaundice, and the liver in various diseases are especially outstanding.

An unusual feature of the text is the periodic use of dark heavy type to indicate summaries of the preceding discussions. This feature makes it possible for the author to present much pertinent information concisely and accurately for a hurried reader. Excellent colored plates

photographs and photomicrographs add much to the overall value of the volume. As is pointed out in the foreword the bibliography of about 2400 references indicates the exhaustiveness of the author's research. All interestedists will profit from this outstanding textbook.

—WARREN H. DIESSNER Col MC USA

THE FUNDAMENTALS OF X RAY AND RADIUM PHYSICS by J. P. S. Lima
M D 340 pag ill tra d Ch l C Th ma P bl h Sp g-
f ld ill 1954 P \$8 50

This textbook is concerned primarily with the application of physics to radiography. One chapter being devoted to radioactivity and radium. The author states that his purpose is to simplify the complex subject of radiologic physics for the student, ray technician and toward this end he has done an excellent job. The standard subjects of energy, matter, electricity and magnetism are well covered. The student prepared for this subject by the natural chapter on simplified mathematics in which a brief review of elementary mathematical principles is presented. The book is units and concepts of radiography such as kilovoltage, filtration, x-ray electric generators, ray tubes, and circuit and the diskromar. It is discussed in separate chapters. There is also a short section on the physical principles of physical procedures such as laminography and telescopic. The final chapters are brief descriptions of protection in radiology.

The book is well written and provides easy reading. Appropriate diagrams illustrate the physical principles discussed. The index is adequate and the references include the standard writings on the subject. This text is highly recommended for training of student technicians with no previous experience in an x-ray department. It is not written for the radiologist but should prove extremely valuable under the circumstances mentioned.—JOHN H. HEALD Lt (MC) USN

MODERN PRACTICE IN ANAESTHESIA edited by F. K. T. E. M. B.
2d ed 622 pag ill tra d P l B H b I N w Y k
N Y 1954 P \$12 50

A general reference text of anesthesiology covering all aspects of this rapidly growing branch of medicine. It is complete, would be impractical and unwieldy. The editor of this book has succeeded to a great extent in overcoming this liability, dealing with the reasonable limits. There are faults, however. The greatest of these is the lack of emphasis placed on the basic scientific and philosophical fundamentals of the art of anesthesia. There are too many uninformative illustrations, particularly those of equipment, and those emphasizing technical detail. The format suffers from being divided into many hot sketchy chapters devoted to anesthesia and specialty surgery. If effectively dealt with in one chapter, the editor would emphasize the basic principles of good respiratory and circulatory physiology, body to be a relaxed and the modification of environment which serves the various parts of the body.

With the new trend toward balanced anesthesia and the concurrent emphasis on muscle relaxants the excellent chapter on the pharmacology and use of relaxant drugs excluding succinylcholine (a relatively recent addition) is notable. There is definite lack of emphasis on oxygen therapy, resuscitation and the poor risk patient. Citations in the text referring the reader to specific page and illustration numbers in standard reference works where the subject can be more adequately covered would improve the text substantially. There is an index but no table of contents or list of illustrations. The bibliography is extensive and parallels the development and application of curariform and synthetic relaxant drugs. —STEWART A. WILBER Lt (MC) USA

THE SURGERY OF PULMONARY TUBERCULOSIS by James H. Fors e
Colonel MC USA 208 pages 59 illustrations 1 in color 11 graphs
and 46 tables Lea & Febiger Philadelphia Pa 1954 Price \$6 50

This publication is based on careful observations made on about 1 000 patients treated for pulmonary tuberculosis at the Fitzsimons Army Hospital since 1947. It is divided into three parts. The first discusses the principles in the application of surgery in pulmonary tuberculosis the second deals with operative surgical procedures and the last describes with supporting statistical data experience with surgical therapy in pulmonary tuberculosis.

Resectional surgery in the treatment of pulmonary tuberculosis tried before the beginning of the present century was abandoned because of the prohibitively high mortality. Safer procedures such as collapse operation became popular. Since about the close of World War II however resectional surgery for diseased pulmonary tissue has become a reasonably safe procedure due to the advent of new antibiotics improved anesthesia and more transfusions. The author has carefully observed this trend and affords the reader an understanding of the operative procedures and indications for their use. The results are early but are indicative of success in that 91 percent of the personnel treated by extirpative surgery are either well or their prognosis for complete rehabilitation is excellent.

The section describing operative procedures is brief and would not be adequate for a beginner however I believe the author's purpose is to describe the present trend and viewpoints relative to surgical therapy rather than to provide detailed descriptions of surgical techniques. The bibliography is small but adequate to the subject. Fitzsimons Hospital has had a large series of cases and these have been carefully studied and followed. In time medical and non surgical methods may be found which will make unnecessary the surgical procedures used at present but as things stand now the book represents a late season of surgery as one of the methods used in the therapy of diseased pulmonary tissue due to tuberculosis. —JOSEPH HANSEN Capt (MC) USA

ALCOHOLISM by J ks A Smith M D 72 pag J B L pp t C
Ph lad lph P 1954 P \$3

This small volume of six chapters on alcoholism is offered as a concise but complete presentation of the presently recognized forms of therapy in this condition. It is written essentially as a guide to the general practitioner in the handling of alcoholic patients and although the sole chapter on psychotherapy with the chronic alcoholic the greatest emphasis is put on the various types of medical treatment. It opens with a chapter discussing the diagnostic features of a chronic alcoholic and describing the progressive physical and psychological deterioration that occurs in the typical case. The last chapter "Treatment of Alcoholism in General Practice" is a general summary of the contents of all the previous chapters. This chapter covers the Antabuse, alcoholism treatment, the aversion treatment, vitamin therapy, adrenocortical extract therapy, sedation, psychotherapy and Alcoholics Anonymous.

Although interesting the entire thing essentially is presented in this little book. Combined with the conciseness of the discussion this seems to make the volume lack structure and authority in its presentation. The most valuable feature for one interested in alcoholism is the extensive bibliography of more than 85 references covering practically every approach to the subject.

—DAVID S. EVANS, Lt Col USAF (MC)

THE YEAR BOOK OF NEUROLOGY, PSYCHIATRY AND NEUROSURGERY
edited by R la d P M kay M D N l D C L w M D d
P l B a l y M D 604 pag ill rat d Th Y B k P b
li b In Ch g ill 1954 P \$6

This yearbook is divided into sections on neurology, psychiatry and neurosurgery. It contains well-written abstracts of the most important articles on the specialties appearing in journals dated November 1952 to October 1953. All phases of each specialty are included and the articles are fairly well illustrated with photographs. Subject matter is indexed as to author and title.

The abstracts on neurology contain numerous articles on the neurotrophic viruses and their subdivisions. Warning is given by the editor on the use of spinal anesthesia, myelography and cerebral arteriography because of the numerous incidents of complication resulting from their use. Convulsive disorder and their treatment occupy their usual prominent position.

In the section on psychiatry the editor emphasizes the continued need for clinical research in mental medicine and outlines a definite objective for such a program. The topic under general psychiatry include wide selection such as the ecology of mental disease, studies in mortality of patients with mental disorders and patterns of biochemical organization. The section on child psychology stresses

the mother and child relationship during the first year and describes how disturbance of this relationship may produce many behavior problems. The articles on schizophrenics are aimed at gaining an understanding of the feelings of the patient in order to make possible a more effective therapy. Barbiturate intoxication is discussed in regard to prompt diagnosis and active treatment. Electroshock and psychosurgery and their results are also discussed.

In the neurosurgical section articles on arteriography, ventriculography and electroencephalography discuss the relative values and the advances in localization of brain tumors by the use of radioactive isotopes and dyes. The developments in the treatment of vascular lesions of the brain and of herniated disks as well as the surgery of epilepsy are adequately reviewed. The section on technic covers the use of controlled hypertension and artificial hibernation in brain surgery.

This book will be of most value to the busy specialist whose time for keeping up with the literature is limited. He will find it extremely useful for reviewing the abstracts pertaining to his more perplexing cases. —WILLIAM J. JAMES *Contrib* (MC) USN

HISTOPATHOLOGIC TECHNIC AND PRACTICAL HISTOCHEMISTRY by R. D. Little M.D. 501 pages. The Blakiston Co. Inc. New York N.Y. 1954. Price \$7.50.

The second edition of this comprehensive reference book on tissue staining technic is brought up to date by the addition of 201 new pages. The arrangement of subjects is generally unchanged but the original chapters are revised and greatly expanded.

The author's major emphasis is on special staining techniques for the demonstration of specific cellular structures and for the identification of their chemical composition. As such it is a useful reference for any laboratory where differential staining problems are frequently encountered. For the inexperienced technician however, the description of each procedure is inadequate and too little advice is given about the pitfalls usually encountered and how to overcome them. There is also insufficient discussion concerning the choice of procedure, detailing advantages and disadvantages of one method compared with another and of the results to be expected and how they should be interpreted. Although there are no illustrations none seem to be needed.

The book does present a remarkable amount of up-to-date information on histopathologic technic including many new practical tables of data. It should find its greatest usefulness in the laboratories of well-trained and experienced tissue technicians and specialists rather than as a textbook or handbook for the use of beginning technicians. —CHARLES C. BRATTON *Lab. Contrib* (MC) USN

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- THE DIAGNOSIS AND TREATMENT OF CONVULSIVE DISORDERS IN CHILDREN by Samuel L ington M D A sistant Professor in Pediatrics The Johns Hopkins University School of Medicine Phys ician in-Charge The Johns Hopkins Hospital Epilepsy Clinic and Electroencephalographer The Johns Hopkins Hospital Laboratory of Electroencephalography A sociate Att nding Physician in Pediatrics and Assistant Phys ician in Medicine Sinai Hospital Baltimore Md 320 pages 92 illustrations Charles C Thomas P blisher Springfield Ill 1954 Price \$9 50
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- A DYNAMIC PSYCHOPATHOLOGY OF CHILDHOOD by Lauretta Bender M A M D Professor of Clinical Psychiatry New York University College of Medicine As sociate Attending Psychiatrist New York University Bellevue Medical Center Senior Psychiatrist in Charge of Children Service of the Psychiatric Division Bellevue Hospital, New York N Y 275 pages illustrated Charles C Thomas, Publisher, Springfield Ill 1954 Price \$7 50
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- ORAL SURGERY by St Ing V M M M S, D.D.S., D.P.S., F.D.S. Professor of Oral Surgery Faculty of Dentistry University of Washington School of Dentistry 1st edition 1949, 2nd edition 1954, 3rd edition 1954 128 pages with 155 illustrations The C V Mosby Co St Louis 1954 Price \$2

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Monthly Message

The *Armed Forces Medical Journal* is to be wholeheartedly congratulated on this issue which marks its fifth anniversary. Since November 1949 when the Armed Forces Medical Publication Agency was authorized by a Department of Defense directive the *Journal* has experienced a steady growth in stature and quality of its articles. In 60 issues the *Journal* has published nearly 1 200 original articles from many parts of the world the majority of the authors have been officers on active duty in our armed services. The editors have been greatly pleased with the occasional note of encouragement which they have received from other well established medical journals.

The *Armed Forces Medical Journal* serves a very definite and important function in the armed services carrying articles on recent developments in the medical and health fields as well as current news on military medicine and dentistry to those who might not otherwise have an opportunity to receive such information.

The Department of Defense earnestly hopes that the *Journal* will continue to enlarge its sphere of usefulness to the officers in medicine dentistry and allied professions in the armed services. In January the *Journal* will initiate a new series reporting each month on a clinicopathologic conference.

With a circulation of more than 25 000 copies of each issue the *Journal* reaches interested readers in many parts of the world. The editors welcome contributions from physicians dentists and other bioscientists whether or not they are in the military service.

Frank B Berry

FRANK B BERRY M D
Assistant Secretary of Defense
(Health and Medical)

NEEDLESS RESTRICTION OF PATIENTS WITH HEALED MYOCARDIAL INFARCTION

WELDON J WALKER *Lieutenant Colonel MC, USA*

OFTEN in the past a patient who had survived a myocardial infarction was advised to "take it easy," restrict your activity or "retire" even though there was no evidence of residual coronary or myocardial insufficiency. There is considerable evidence that such restriction not only results in a tremendous loss of manpower to the nation but may even be detrimental to the patient's health and chances for survival. Fear that strenuous physical exertion may precipitate coronary thrombosis in a person with pre-existing atherosclerosis has been the chief reason for restricting the activities of such patients.

In view of the fact that demonstrable coronary atherosclerosis was found in 77 percent of United States soldiers killed in Korea at an average age of 22.1 years¹ a critical re-examination of this view is indicated. If physical exertion is dangerous for patients with this disease, then every adult American male should creep to the nearest wheelchair, because most have pre-existing coronary atherosclerosis¹. In addition, the reverse correlation between coronary thrombosis and physical activity seems to exist. In 1927 Glendy and others² reported that Americans who had myocardial infarctions early in life came largely from sedentary groups while those who maintained good health beyond 80 years of age had engaged in more than average amounts of exercise.

Analysis of the incidence of coronary disease in England made by the General Register Office³ showed that during the years 1930-1932 laborers had only one fourth the coronary artery disease of those in professional occupations, while in 1949 its incidence had increased to two thirds of that found among professional groups. Keys and associates made an extended study in various countries of Europe to determine the factors associated with the low incidence of atherosclerosis in Europe as compared with the United States. In Spain, where the most extreme discrepancy exists between the living standards of laborers and professional groups, they found a high incidence of

coronary disease in professional people particularly physicians but could find no cases to study among laborers. These findings probably reflect the correlation between dietary fat state of nutrition and incidence of atherosclerosis.

TABLE 1 Typ / t ty t t / 1 347 att k /
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Act ty	N mb f ata k	P t
Sl p	305	22.6
R t	401	29.8
O duna y mild t y	302	2.4
M d rat ty	117	8.7
W lk g	198	14.6
U usual rt	24	1.9
T tal	1 347	100.0

In the United States significant differences in the state of nutrition of various economic groups have largely disappeared due to the favorable economic status of the laborer and a recent study found no correlation between coronary artery disease and occupation or social status. As indicated above this same trend is also evident in England. If physical exertion were an important factor in precipitating coronary occlusion however one would expect the highest incidence among laborers and in no study has this ever been found.

RELATIONSHIP BETWEEN ACTIVITY AND ATTACKS

Another approach to the problem has been to obtain detailed histories of the state of physical activity preceding the onset of acute coronary occlusions. The largest published study is that of Master and Jaffe who determined the degree of activity before and at the onset of 1 347 attacks of coronary occlusion. They summarized their findings in a table (table 1). The attacks were equally distributed through all hours of the day and night. In less than two percent was the onset associated with unusual exertion. They concluded that this association was coincidental and that coronary occlusion is a spontaneous event in the course of atherosclerosis. A recent study by Richardson reporting the same findings concluded that Attacks of coronary thrombosis will occur at any time day or night and are in no way related to the person's activity or emotional state.

In contrast to these findings, Yater and associates⁹ analyzed 689 attacks of coronary thrombosis in American soldiers below the age of 39, and reported a greater number of attacks in association with strenuous activity than one would expect from the time spent in such activity. It was concluded, therefore, that physical activity seemed to be a factor in precipitating some attacks of coronary thrombosis.

Is there any way that these divergent conclusions can be reconciled? First the study by Master and Jaffe is largest thus should perhaps be given greatest weight. Second if strenuous activity precipitated coronary occlusion in soldiers, one would expect a greater incidence in the more strenuous branches of service such as the infantry. Actually the reverse was observed and more than the expected number of deaths occurred in the more sedentary branches such as the Medical Corps, Finance Department, and Adjutant General's Office.⁹ Third autopsy studies showed a higher incidence of old or organizing thrombi in the coronary arteries in those with the onset during exertion than in the arteries of those with the onset during sleep. This strongly suggests that some of the former actually had sustained a coronary thrombosis earlier and were erroneously reported to have had the onset of their attacks during strenuous activity.

It has been postulated that increased blood pressure from physical activity will rupture capillaries growing in atheromatous plaques lining the intima of coronary arteries and lead to thrombus formation.¹ There is little basis in logic or fact to support such a view. Winternitz and others¹¹ injected fluid into the coronary arteries after death with a pulsatile pressure exceeding 500 mm Hg without rupturing these capillaries. At autopsy, capillary hemorrhage is no more frequent in hypertensive patients than in normotensive ones,⁷ furthermore if increased systemic pressure is transmitted to the lumen of these capillaries the same degree of pressure supports their outer walls to protect them from increased stress (fig. 1).

Neither is there evidence that activity within the range of the patient's myocardial or coronary artery reserve is detrimental to his health. Phipps² studied 500 cases of heart disease in workmen for the Massachusetts Industrial Board, and concluded that the manual laborer who had heart disease but who for economic reasons must continue working had a better life expectancy than the private patient or "white collar" worker. A recent study based on findings in several million British laborers³ indicated that middle aged men in physically active jobs had a lower incidence of coronary heart disease than men in physically inactive

jobs Furthermore in physically active workers the disease was not so severe the early mortality rate was lower and survival from onset of the disease to death was longer Franco reported that 896 persons with heart disease employed by the Consolidated Edison Company of New York had an over all ab-

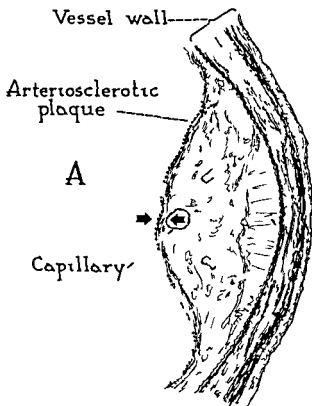


Fig 1 The transcapillary pressure will tend to force the plasma into the arterial lumen. The capillary will contractly upstated by this means the elevation of arterial pressure will place no increase in the capillary wall. (Drawing by George J. Thomas)

senteism 25 percent below the company average and were productively employed in nearly 400 job classifications Then why has the idea of restricting such patients become so ingrained in medical and lay thinking?

ANGINA PECTORIS VS CORONARY THROMBOSIS

Failure to clearly separate angina pectoris from coronary artery thrombosis appears to be the principal reason Although both have the same underlying pathologic process namely coronary atherosclerosis they differ in respect to the exciting cause of

the attack. Everyone knows that exertion as well as emotion can precipitate an attack of angina. The mere fact that many patients literally suffer thousands of attacks before dying of a thrombosis that usually comes on at rest would argue against the danger of subanginal exertion to a patient with coronary artery disease. Such exertion is probably an important factor in stimulating the development of needed collateral vessels. The reason patients with angina should avoid activity that will precipitate pain is that myocardial ischemia with its associated accumulation of metabolites may increase cardiac irritability and induce such dangerous arrhythmias as ventricular tachycardia and fibrillation but not coronary artery thrombosis. In fact the potent vasodilator action of local metabolites combined with the increased rate of blood flow associated with exercise provide the factors that are generally recognized as desirable to prevent intravascular thrombus formation in other parts of the body.

Often our thinking fails to keep pace with the evolving changes that take place in an infarcted myocardium. During the acute stage the patient is put at strict rest because of the ever present risk of rupture through a mushy infarcted myocardium. Ten per cent of deaths from coronary thrombosis result from cardiac rupture which usually occurs between the fourth and eleventh day.⁵ The incidence of myocardial rupture is higher in patients who maintain hypertension or fail to restrict their activity at this time.¹ Activity during the period of acute infarction also predisposes to the development of ventricular aneurysm and congestive failure. More than one month after an infarction however the danger of cardiac rupture is no longer present. Because studies indicate that myocardial rupture is almost unknown through an area containing fibrous tissue a healed myocardial infarction is the area of the heart least likely to rupture. Following the formation of a firm scar there are in my opinion but two reasons to continue restricting the patient's activity: (1) cardiac insufficiency in which so much of the myocardium has been damaged or destroyed that the heart no longer functions effectively as a pump and there is dyspnea on exertion; (2) coronary insufficiency with angina or cardiac arrhythmia induced by effort.

PHYSICIAN'S DUTY TOWARD THE PATIENT

We make a grave mistake by not explaining carefully to each patient with a myocardial infarction that, following recovery from the acute episode, the condition for which strict restriction was ordered no longer exists; otherwise he will believe that to prevent further difficulty his future activity should approximate that which was allowed during the period of treatment. Such restriction deprives him of the ability to discharge emotional tension

through accustomed physical activity anxiety is increased he consoles himself by eating weight gain results and the stage is set for progression of the atheromatous process and for his early demise Also if the patient is advised to resume normal activity but it is not made clear to him and to his relatives that death is no more likely to strike him on the job than at rest the relatives will tend to blame the physician for not restricting the patient's activity should he die from a later attack If on the other hand the timid physician plays it safe and routinely puts all such patients in a rocking chair he can't lose If they subsequently drop dead he was very astute to have recognized how sick they were if they don't he can claim credit for their survival

In my opinion the physician's fear of sticking his neck out and risking possible criticism is the principal cause for many restrictions placed on such patients with a resulting loss of many years of productive living Because the average patient who has survived a myocardial infarction probably has a life expectancy in excess of 10 years and because as many as 75 percent of these patients can be returned to productive employment,² it is important that those who are otherwise without residual disability shall not suffer needless invalidism through an unfounded fear of death from physical activity

SUMMARY

Because numerous studies have shown an increased incidence of myocardial infarction in sedentary occupations and a corresponding decrease among laborers the belief that strenuous physical exertion may precipitate myocardial infarction in a person with pre-existing coronary atherosclerosis needs critical reevaluation. It has been found that 77 percent of American soldiers killed in Korea had demonstrable coronary atheromata. Physically active workers with coronary artery disease have a lower early mortality and a longer survival from the onset of their disease than sedentary workers To restrict the activity of a patient who has survived a myocardial infarction without residual cardiac or coronary insufficiency probably shortens his actual survival and surely shortens his useful life

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CANCER OF THE STOMACH

The results following excision of the stomach for anaplasia are not as bad as one might think largely because the results following curative resections are fairly good. However the high incidence of inoperability (50 to 65 percent) is serious and we must try to obtain these patients earlier. I believe that the best opportunity we have of achieving that is to do more x ray studies of patients who have mild dyspepsia.

—WARREN H COLE

in P stg aduat M d ci e
p 45 July 1954

NEUROLOGIC DISEASES ON THE ISLAND OF GUAM

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IN THE course of an investigation of the frequency of amyotrophic lateral sclerosis on Guam a number of persons with various other neurologic disorders were observed. Because of the isolation of the island and the relatively small size of its population, these observations provide an estimate of the prevalence of neurologic diseases which may be of some general interest.

Arnold and his associates who were stationed at the U S Naval Hospital on Guam in 1947 and 1948 originally reported that amyotrophic lateral sclerosis was unusually prevalent among the natives of Guam. Their report has been confirmed and amplified by other investigators. This article is one of a series of reports on the findings of the latest study which was jointly sponsored by the Bureau of Medicine and Surgery, Department of the Navy, the U S Public Health Service and the Government of Guam. Because of the interesting history of the island and its people and the possibility that many of the still unanswered questions relating to the distribution and the etiology of the neurologic disorders might be clarified by a better understanding of the geography and history a brief summary of these is presented.

GEOGRAPHY AND HISTORY

Guam lies 1 500 miles east of the Philippine Islands and 1 800 miles south of Japan in the Western Pacific Ocean (fig 1). Its area of 205 square miles makes it almost as large as the combined areas of the remainder of the Mariana Islands. The island is broken up into two distinct geographic portions. The southern half is volcanic with mountain peaks rising to 1 334 feet. The northern half of the island is an elevated limestone plateau from 300 to 600 feet above sea level.

The island was discovered and claimed for Spain by Magellan in 1521 following his landing at Umatac (fig 2) It was not colonized by the Spanish, however until the early seventeenth century ⁴ As a result of the wars of conquest and the introduction of epidemics, the population of the Marianas, which had been estimated at 70,000 in the early seventeenth century, was reduced to 1,634 by 1700 ⁵ During the wars a number of families escaped to Rota but the remaining natives, ⁶ principally women and children, were herded together on the island of Guam The other Mariana Islands were left to the sea birds until the early nineteenth century ⁷

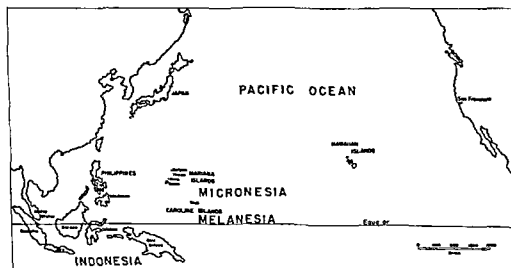


Figure 1 Map of the Pacific area

The present-day Chamorros, the natives of Guam are the descendants of Spanish, Mexican and Filipino soldiers and of the Chamorro women who survived the war and the epidemics More recently, with the advent of the whaling ships, there has been an additional admixture of British and American blood ⁹ Chinese and Japanese traders were on the island at the time of the original Spanish conquest¹⁰ and have been successfully merged into the population Thus the present-day Guamanian is a fusion of many racial strains and it is probably true that there are no pure blooded Chamorros

The islands remained under Spanish control until 21 June 1898, when they were seized by the U S S *Charlestown* During the Spanish period the island governors were at first responsible to Mexico, and after 1831 to the Philippines The island was forgotten for years at a time and more nearly resembled a sleepy Hispanic American hacienda than an oceanic colony ¹¹ Following the Spanish conquest the population gradually increased so that in 1800 the census revealed 3,464 Guamanians and in 1855 the

total was reported as 8 207 In 1856 smallpox which was brought to the island aboard the American schooner *Frost* reduced the population to 4 724 inhabitants ² Since this epidemic in 1856 the population has shown a steady increase This was originally aided by the Spanish custom of sending large numbers of Spanish and Filipino prisoners to Guam A census in 1901 shortly after

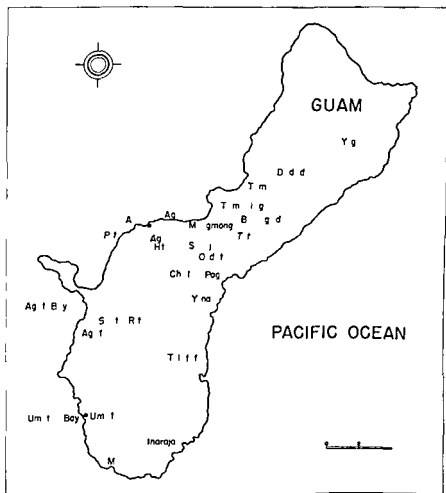


Fig 2 M p f the isla d f Guam.

the American occupation showed a population of 9 676 The census of August 1959 showed a Chamorro population of 29 392 and according to the latest census the population since then has grown at an annual increment of more than 10 percent¹ In addition to the Chamorros there are about 12 000 Filipino laborers and 50 000 armed services personnel with their dependents on the island at the present time

The Chamorros have long had a well defined class system, partly hereditary, partly based on wealth, position, and education, with strong social taboos against marriage between classes. The original social and economic structure of the islands was considerably altered by the 230 years of Spanish colonization.¹⁵ At the end of the Spanish regime most of the Chamorros were living in towns. Agriculture and the family farmsteads were an important part of their economy, with taro, sugar cane, coconuts, rice, bananas, maize, sweet potatoes, and citrus fruits as important food crops.¹⁶ Fish were obtained from the lagoons, and the native hogs and chickens, along with cattle, furnished meat. This social and economic structure was little altered by the American occupation in 1901 and it was not until the reoccupation of the island by the American forces in 1944 that the social pattern was appreciably altered. The destruction of the city of Agaña, in which half the island's population had resided, the introduction of new roads, the change to a money economy with dependence on imported foods, and the formation of a new wealthy class have all changed the social structure. The small farming villages in the southern part of the island are relatively isolated and were not destroyed during the war, and it is in these areas that many of the old Spanish customs are particularly maintained.

AMYOTROPHIC LATERAL SCLEROSIS

In August 1953 a survey of the island's principal sources of medical information demonstrated that amyotrophic lateral sclerosis was highly prevalent among the Chamorros and was seldom if ever, found either in the large transient Filipino population or in armed services personnel on the island.¹⁶

During that survey, 42 patients (25 males and 17 females, ratio males to females 1.5:1) with amyotrophic lateral sclerosis were observed in the villages on Guam. The highest prevalence rate was noted in the village of Umatac (fig. 2). The prevalence in the other villages varied widely and apparently in an erratic fashion. The variable distribution may have had some biologic significance but the uprooting and redistribution of the population following the war, as well as the variability of the case finding facilities of the local public health nurses, seemed to be important factors.

Some of the 42 patients found in the previous survey had also been seen in the previous surveys by Arnold and associates,² Koerner,² or Tillema and Wynberg;³ other patients were called to our attention because the village nurse, commissioner, or priest suspected a progressive paralytic disease, while still others were located through the neurologic index of the local hospital records. In the course of our frequent visits around the

island and our inquiries as to diseases causing weakness or paralysis numerous patients with other neurologic disorders were called to our attention. Because we made no systematic search for any diagnoses other than amyotrophic lateral sclerosis however these other conditions, which are of general interest are presented in a descriptive fashion only the statistical analysis has been limited to amyotrophic lateral sclerosis.

SYMPTOMS

The symptoms of amyotrophic lateral sclerosis characteristically began with weakness and wasting in a striated muscle group most commonly the small muscles of the hand or shoulder. This wasting progressed fairly symmetrically involving the entire musculature of the body including those muscles innervated by the ninth tenth eleventh and twelfth cranial nerves. The atrophy and weakness were associated with muscle fasciculation. Concomitantly with the atrophy there was spasticity which usually began in the lower extremities and was associated with hyperreflexia and Babinski signs. Both the spasticity and the atrophy progressed rapidly and early in the course of the illness one saw the characteristic hyperreflexia with wasting and fasciculations. Terminally the spasticity became less pronounced and eventually the atrophic changes in the musculature left the patient with a flaccid type of paralysis. Examination of the sensory system revealed no abnormality nor was there evidence of impairment of mental function.

AGE DISTRIBUTION

The age distribution at time of onset shows the mean for both sexes to be about 44 years of age. Two thirds of all patients had their first symptoms between the ages of 35 and 55 years. The youngest patient in the previous survey was 20 years of age, the oldest 60 years of age. Arnold and Koerner had reported the upper age limit in their studies to be about 69 years. In a later house-to-house survey described below two additional patients 70 and 74 years of age respectively were found with relatively early signs of disease. The median period of survival for the patients with amyotrophic lateral sclerosis on the island of Guam was estimated as three years.

Almost all of the 42 patients observed in the general survey had moderately advanced to advanced disease. It was our impression that most patients with early disease were being missed in that survey. It was estimated at that time that we had been successful in locating only about two thirds of the existing cases on the island. To test this assumption and to see if we could

provide a clearer picture of the distribution of the disease on the island in the hope that this would provide possible leads with regard to the causes of the disease, house to-house surveys in selected villages were conducted, beginning in November 1953. The first villages chosen were Umatac, Merizo, and Dededo (fig 2). Merizo (population 1,037*) and Umatac (population 601*), lying in the southern, volcanic part of the island, have been influenced very little by migration for hundreds of years and have been least changed by the postwar migration. Dededo, a village lying on the northern limestone plateau, is a new village built in 1944 after the reoccupation by the U S Naval Government, and is of about the same size as the other two villages combined (population 1,555*). The inhabitants of Dededo are principally former Agaña residents, although all of the other villages except Umatac and Merizo are represented in its present population.

The prevalence rate reported for Umatac had been the highest on the island (four cases among 601 inhabitants), yet in the neighboring village of Merizo (population 1 037) only one patient had been located and this patient was a native of Umatac who had recently moved to Merizo. In Dededo no living patient with amyotrophic lateral sclerosis had been located. In the three villages, the previous survey had disclosed a total of five living patients.

METHOD OF STUDY

In the course of the house to-house survey, an attempt was made not only to examine each resident but also to obtain a general idea of living conditions, food habits, possible sources of infections, and so forth. In most instances, an interpreter was essential because of the language and cultural barriers, and one of us (L I), a graduate of the Navy School for Native Practitioners, proved to be very helpful in this assignment. The examination carried out included interrogation about the patient's health, observation of the patient's gait and speech, examination of the muscles of the tongue, shoulder, forearm, hands, and calves, testing of the biceps, triceps, patellar, Achilles, palmo-mental, and plantar reflexes, and examination of eye movements. In the presence of suspected neurologic disease, a more extensive examination was carried out either at the hospital or in the village nurse's office. It was possible to examine 95 percent of the total population of Merizo and Umatac. In Dededo it became necessary because of lack of time, to limit the examination somewhat to the adults, 85 percent of the adults in this village were examined in the time available.

RESULTS OF SURVEY

As a result of the house to-house survey we found that there were at least seven patients in Umatac (previous survey four) six in Merizo (previous survey one) and three in Dededo (previous survey none) for a total of 16 patients (previous survey five) In these three villages as a unit at least, our previous survey had actually failed to locate two thirds of the cases We might therefore assume that our previous survey in all villages had likewise been successful in locating only one third of the cases The two larger villages (Merizo and Dededo) however had been selected primarily because of the low rate previously reported and it is in these villages that the greatest discrepancy was noted Perhaps the technic in our previous survey had been least adequate in these villages We had assumed however that the previous survey in Umatac in which the highest prevalence rate was reported had been quite complete but even here we found that only about half the cases had been located originally Furthermore the majority of the amyotrophic lateral sclerosis patients found in the house to-house survey were in a relatively early state of disability and this did suggest that the previous survey had been successful in locating merely the more advanced cases of the disease

Thus it appears that our previous estimate that 42 patients represented about two thirds of the total number was conservative it is now our belief that this previous survey actually represents only about one third of the total cases and the actual number today approximates 125 cases On this basis, the prevalence rate of amyotrophic lateral sclerosis for the total population on Guam is about 400 per 100 000 population or at least 100 times that estimated for Canada the United States (mainland) United States (Hawaii) Great Britain and Norway

Because almost 60 percent of the natives of Guam are less than 20 years of age and not at risk from this disease about one percent of the adults (more than 20 years of age) at any time have amyotrophic lateral sclerosis

There would still appear to be some variation in the prevalence of the illness on the island of Guam itself In the town of Dededo the prevalence rate is about one tenth that found in Umatac although a house to-house survey was made in both villages Although no adjustment in rates has been made for differences in the age distribution in the population this would not appear to alter appreciably the difference in rates between Umatac and Dededo

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Two of the Merizo patients had been born in Umatac and had moved to Merizo following their marriages, whereas all the seven patients in Umatac had been born in Umatac and had lived there most of their lives. Thus, on the basis of the indigenous population of Merizo, it would appear that the prevalence rate was lower there than in the neighboring village of Umatac. We cannot be certain of this, however, because the population of Merizo is relatively deficient in the number of adult males. In 1944, about 50 of the Merizo adult male leaders were killed by the Japanese in the only large scale massacre on the island. These men represented a sizable proportion of the adults in the village who would have been included in the population at risk today had they survived.*

On the basis of the mortality statistics available, four percent of all deaths on Guam and eight to 10 percent of all adult deaths are now due to amyotrophic lateral sclerosis. Further evidence for the impression that there is a difference in the frequency of amyotrophic lateral sclerosis on the island is found in the mortality reports.

The death records for the past eight years (Dededo was established in 1944) list many deaths from Umatac as caused by amyotrophic lateral sclerosis but relatively few from Dededo. Umatac has been recognized in all the previous surveys as being the community with the highest prevalence of the disease.³ In fact, at the present time *one third to one fourth of all adult deaths in this village are due to amyotrophic lateral sclerosis*.

HISTORY OF THE DISEASE ON GUAM

Amyotrophic lateral sclerosis has been present on the island of Guam for many years. The older residents have described persons who died of this illness during the Spanish occupation. It was our good fortune to find the death records going back to the period immediately following the American occupation, about 1900. These were among the few pre World War II records that were not destroyed and proved to be a valuable source of information.

We were able to find an occasional diagnosis of progressive muscular atrophy as early as 1904 (fig. 3). Throughout the entire record there were many deaths in people of middle and older age recorded as due to "paralysis" which we found was the term

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used synonymously by the village commissioners for amyotrophic lateral sclerosis

Thus amyotrophic lateral sclerosis is certainly not a new disease on Guam. It is not possible however to determine on the basis of the statistics now available whether the incidence rate has changed over the past 50 or more years.

There appears to be a variation of the disease prevalence not only geographically but also by social and economic status. Almost all patients come from the lower class according to our interpreter's evaluation of class. Patients living under superior economic and sanitary conditions were also seen, however a few of whom were living away from the island and in the

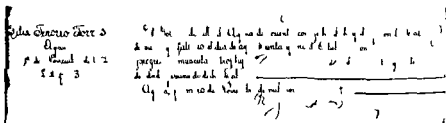


Fig. 3 Copy of the letter for the muscular atrophy Guam 1904

U S Navy when their first symptom developed. Amyotrophic lateral sclerosis in adult family members would probably influence the income potential of the family. It is possible that if the illness occurred in succeeding generations of the same family such a lower status might be a result rather than a causative factor.

DIFFERENTIAL DIAGNOSIS

In the course of this survey we examined many patients with neurologic diseases other than amyotrophic lateral sclerosis. Often these patients came to our attention because the nurse or relative was unable to differentiate their condition from amyotrophic lateral sclerosis. More commonly the patients were shown to us because of our known interest in all patients with neurologic disease or they were seen routinely in our house-to-house survey.

The sequelae of infectious illnesses seen included those in patients who had had pneumococcal meningitis, leprosy and paralytic poliomyelitis. The latter disease is uncommon among the natives of Guam although determination of titers in the blood of Guamanians has revealed a very high incidence of previous infection with the poliomyelitis viruses.⁷ One serious epidemic in 1899 is described in the Annual Naval Medical Record and

was also described to us by a resident of Merizo who has bilateral lower motor neuron paralysis dating from this epidemic. The occasional patient seen with residual paralysis had usually had the infection in the first few years of life.

Leprosy, at one time a common scourge throughout the Marianas, is now rarely seen on Guam. Three patients in the southern part of the island had the sequelae of leprosy, including the characteristic ulnar nerve involvement with atrophy and sensory loss in the hand.

Although tuberculosis is a leading cause of death on the island and tuberculous meningitis is not infrequently seen in the hospital, we observed no new cases ourselves. Encephalitis has been endemic on the island and postencephalitic parkinsonism which was observed will be discussed separately.

We observed 12 patients with evidence of impairment of cerebral circulation (usually hemiplegia) several patients who were classified as senile, a number of persons with peripheral nerve injury, and three patients (two of whom were siblings) with Charcot-Marie Tooth syndrome. One additional family group, which we will discuss in detail, suffered from hereditary spastic paraplegia. Also seen occasionally were patients with achondroplasia, mongolism, hydrocephalus, microcephaly, and cerebral palsy. Albinism with nystagmus was seen in six family groups.

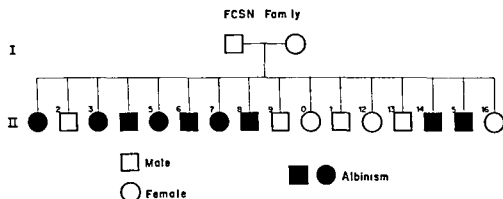


Figure 4 Pedigree of family with albinism.

Because the parents of the persons affected were not albinos, it would appear that the abnormal gene was recessive (fig. 4). In four of the six family groups, the persons involved were cousins.

Multiple sclerosis, a relatively common illness in Canada and the northern United States, was not diagnosed in a native. The one patient in whom we made a tentative diagnosis of multiple sclerosis was a 49 year old Caucasian who had been on the island for only two years. He described an episode of blindness

in the left eye which persisted for several weeks and which occurred some 20 years before while he was living in New York City. He also vaguely described an episode of numbness affecting the left side of the body which had occurred many years ago. Neurologic examination revealed pallor of the left optic disk and bilateral Babinski sign although the patient described himself as well. The relative infrequency of multiple sclerosis in warm climates has previously been described.

No native patient was examined in whom a tumor of the central nervous system or a protruded intervertebral cervical disk was diagnosed. This is in accord with the experience of the Guam Memorial Hospital and the Guam Naval Hospital where tumors of the central nervous system are rarely seen either clinically or at necropsy. However, it is not known for certain whether this experience in this small population indicates a true lower incidence of such disorders.

PARKINSONISM

During the course of our study 92 patients with parkinsonism were examined. In most instances the parkinsonism was believed to be postencephalitic in origin and the syndrome seemed similar to that which one of us (D. W. M.) had described as following an epidemic of western equine encephalitis.⁴

The illness characteristically began at about the age of 40 years with a disturbance in sleeping habits. Inquiry often brought out a history of fever with headaches in 1947 or 1948. Relatives complained that the patients had difficulty in staying awake and were slowed both mentally and physically. Examination revealed an inability to perform fine movements and cogwheel rigidity and tremor were present. Excessive sialorrhea and sweating were observed with dysarthria, memory defects and immobile facies. The reflexes were hyperactive and the Babinski sign was often present. Fasciculations were absent in these cases and the muscular wasting seemed secondary to upper motor neuron lesions.

Case 1. This Guamanian man, born 9 October 1904, was originally seen on 19 August 1953. The patient was unable to give coherent story and the history was therefore obtained from his wife. She related that in the latter part of 1947 the patient had an acute febrile illness associated with severe headache and drowsiness which subsided in several weeks. Following this original episode the patient continued to be drowsy and complained of an inability to think properly. Examination revealed an obese Guamanian man. He was difficult to rouse and his speech was unintelligible although no atrophy of his tongue or lips was observed. Eye movements were normal except for con-

vergence which was markedly impaired. There was a gross tremor about the lips and tongue. No other cranial nerve abnormalities were observed. Movement of the extremities was markedly impaired and the patient was unable to perform fine movement with either extremity. A tremor both at rest and while attempting purposeful movements was observed to be more marked in the right hand than in the left. Increased muscle tonus with some cogwheel rigidity was apparent in all extremities; again this was more marked on the right than on the left side. The deep reflexes were hyperactive with a positive Babinski sign in the right foot. The patient was reexamined six months later at which time his symptoms had shown considerable progression. Several weeks thereafter the patient died of a complicating bronchopneumonia.

These symptoms and findings seemed most compatible with a postencephalitic type of parkinsonism. An epidemic of Japanese B encephalitis was reported on Guam which began in December 1947 and subsided in April 1948. Extensive serologic investigation at that time revealed that the virus of Japanese B encephalitis had been present on the island for many years, although the one recognized outbreak among the natives occurred in the southern part of the island.

PROGRESSIVE FAMILIAL SPASTIC PARAPLEGIA

Three siblings were examined during our survey who during adolescence had noted the onset of difficulty in walking, with spasticity most marked in the lower extremities but also present in the hands. The disturbance was progressive and was associated with mental dulling. There was no evidence of sensory abnormality; examination revealed bilateral Babinski signs with hyperreflexia. Muscle atrophy although present, was secondary to the upper motor neuron lesion.

Case 2 This 20 year-old Guamanian man first noted difficulty in walking in 1945 at the age of 11 years. He had noted increasing spasticity involving his arms and legs and now walks with difficulty. Two of his siblings, aged 18 and 16 years, have a similar disorder which began at about the age of 11 years while the other three siblings below the age of 10 years are apparently well. The patient's scholastic record was poor. Examination revealed a slight poorly developed man with no skeletal abnormality. He walked with a typical spastic gait and was unable to perform fine movements with his hands. No sensory abnormalities were noted. The deep reflexes were all hyperactive and bilateral Babinski signs were observed. A mild intention tremor was observed in both arms; it was more marked on the right side than on the left.

Because this syndrome is occasionally referred to as juvenile amyotrophic lateral sclerosis," the parents were questioned

as to relatives with possible amyotrophic lateral sclerosis. No evidence of such a relationship was uncovered. Moreover, we saw no evidence of anterior horn cell disease or of involvement of the muscles innervated by the cranial nerves. In our opinion, familial spastic paraplegia and juvenile amyotrophic lateral sclerosis are more closely related to the group of hereditary ataxias than to amyotrophic lateral sclerosis.

COMMENT

Amyotrophic lateral sclerosis is at least 100 times as prevalent on the island of Guam as in the continental United States, Hawaii, Canada, and those countries in Europe for which statistics are available. Although it has been highly prevalent for at least 50 years and probably much longer, there is insufficient evidence to determine whether there has been any change in incidence with time. Clinically and pathologically, the disease on Guam is similar to that seen in the continental United States.²² This article is an in progress report on a continuing epidemiologic and clinical study of amyotrophic lateral sclerosis.

Although we hope further study will clarify the cause of amyotrophic lateral sclerosis on Guam, it seems worth while to review some of our data at this point.

The highest prevalence of the disease was noted in the village of Umatac and also among the "lower classes." Umatac is a relatively isolated village which Don Felipe de la Cortes, a former Governor of Guam, described in 1870 as follows: "Umatac is a little hamlet which ekes out a wretched existence with the help of the ships (whalers) which have to go there for water. It lies at the foot of a mountain range which leaves it no room for fields, nor can it be reached by any road."

Conditions in Umatac have changed little. A road has been completed into the village but it is often impassable. The whalers, who last used the harbor in 1890, have been replaced as a source of revenue by Sunday tourists. Sanitary and health conditions are poorer than in any other village on the island and one can assume that similar conditions are found among the lower classes elsewhere. It is thus possible that exogenous factors account for the variation in the prevalence of the disease. We hope that the careful epidemiologic study which we have undertaken will help us to evaluate some of the possible exogenous factors. Simultaneous studies on other islands inhabited by the same and other racial strains with similar living conditions are being carried out and should provide useful comparative data.

Amyotrophic lateral sclerosis occurs also among Guamanians who live in what we would consider superior economic health.

and sanitary conditions. Because a few of our patients developed the disease while on duty with the U S Navy away from Guam, it is possible that genetic factors are important.

The presence of the disease in family groups is recognized in Guamanian folklore. A Umatac family is mentioned in a folk tale as having been cursed with this illness sometime during the period in which the Augustinian monks were on the island (1769-1898). Three of the patients we examined in Umatac are descendants of this same family. The death records for the island, even as far back as 1904, list deaths in this same family from a pro-

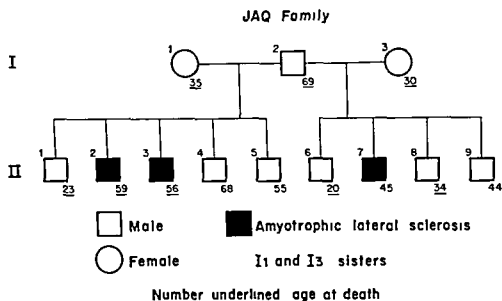


Figure 5 Partial pedigree of family in Umatac, Guam, with amyotrophic lateral sclerosis

gressive paralysis. One of our Umatac patients, a member of this family, has two brothers, a paternal uncle and aunt, four paternal cousins, and one nephew who either now have the disease or have died from it. (Part of the pedigree is shown in figure 5.) Two of the other patients whom we saw in Umatac are illegitimate sons of illegitimate mothers, and thus we know little of their ancestry.

Although the familial aggregation of cases in Umatac (and elsewhere on Guam) strongly suggests the possibility of a genetic causative factor, it is difficult to show this in the present Umatac population where our most detailed studies have been carried out. Umatac has been relatively isolated for centuries and because of its poor and limited farming acreage few people have moved in from other villages, although persons from Umatac have migrated elsewhere. Ninety-eight percent of the Umatac popula-

tion today were born in Umatac. In this village there are three principal families and the interrelationship between these families is extensive. Amyotrophic lateral sclerosis has been so prevalent in this community and the interrelationships are so great that the occurrence of several cases within any pedigree might be due to chance. It is expected that careful examination of pedigrees in other villages as well as in Umatac may shed some light on this problem.

Although amyotrophic lateral sclerosis has always been described as a disease which is not inherited, recent evidence shows that it does occur in familial aggregations and presumably may be inherited as a mendelian dominant characteristic. Although all exogenous factors on Guam have not been eliminated as possible causative agents, it is our impression at the moment that the familial aggregation of cases which we have noted there is basically due to some genetic mechanism. Whether this mechanism is influenced by some external factor such as excessive fatigue or body cooling which some Guamanians believe is an important precipitating cause or is due to some endogenous factor that affects penetrance remains to be seen.

SUMMARY

Amyotrophic lateral sclerosis is at least 100 times as prevalent on the island of Guam as in the continental United States, Hawaii, Canada, and those countries in Europe for which statistics are available. In fact, it has been highly prevalent on Guam for at least 50 years, probably much longer than that. The disease appears similar clinically and pathologically to that seen in the continental United States. The prevalence of the illness varies within the island, being commonest in the southern village of Umatac and for the most part decreasing in prevalence northward. Although this study is not completed, many of the present data suggest that on the island of Guam amyotrophic lateral sclerosis may be inherited.

Other neurologic diseases on the island of Guam are briefly discussed. Postencephalitic parkinsonism and congenital disorders seem unusually prevalent while multiple sclerosis and perhaps central nervous system tumors are uncommon.

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Examination on his present admission revealed a fairly well developed but poorly nourished man who appeared chronically ill. Physical findings were related to the right chest and scapula. The dorsal scapula was exposed by ulceration except for a two-inch bridge of skin covering the middle surface (fig 1). The supraspinatus and infraspinatus muscles were nearly completely absent. Shoulder action was limited to 15° abduction and was



Fig 2. Mith-1 app f the apl t
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very painful. Functions of elbow and forearm were normal. A roentgenogram of the chest and scapula revealed an extrapleural cystlike pocket along the lateral thoracic wall. The right hemidiaphragm was elevated and attached to the lateral chest wall at the inferior aspect of the cystlike pocket. There was an associated platelike atelectasis of supraadjacent lung tissue. The scapula presented a moth-eaten appearance involving the acromion and glenoid process (fig 2). Our first impression was that the patient had an amebic abscess of the liver that extended

through the diaphragm along the extrapleural space to the chest wall and involved the scapula

Routine laboratory examinations including a presumptive Kahn test were negative Liver function studies were essentially normal Bacteriologic consultation and study, including stool examination over a 10-day period, failed to demonstrate amebas

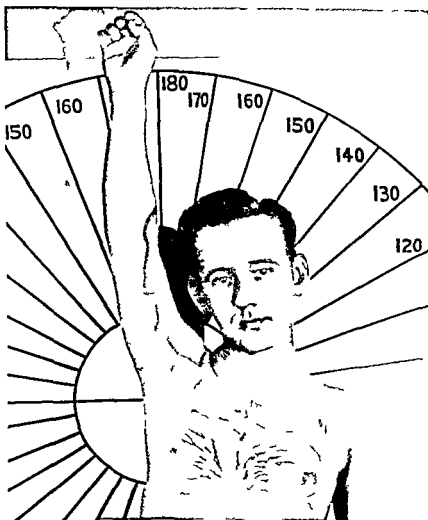


Fig e 3 Eighteen months postoperative view. Arm abducted to 180

Organisms of the proteus group were identified of the ulcerated area of the scapula. Skin dermatomycosis, coccidioidomycosis, and tuberculosis. Multiple scrapings, smears, and cultures for fungi. Complement fixation for amebiasis was positive.

Wet dressings of neomycin were applied to the scapula and a course of anti-inflammatories of oxytetracycline (terramycin) and chloramphenicol.

The drainage subsided considerably but not entirely on this regimen

On 12 December 1950 the extrapleural pocket was unroofed by removing the sixth rib. The pocket extended from the second to the seventh rib at the anterior axillary line and along the seventh rib posteriorly to the costovertebral angle. There was no free fluid in the cavity. The space was packed and a sterile

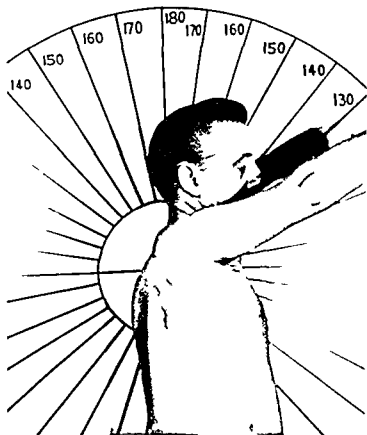


Fig. 4. Eight months postoperative showing (a) fluid level at 120°

gauze dressing applied. Smears, culture, and pathologic study of the tissue removed showed nonspecific chronic inflammation with no evidence of amebas.

On 23 December 1950 a total scapulectomy was performed. The scapula was entirely devitalized and because of its fragility was removed piecemeal. The defect left by the bony glenoid rim was closed tightly with a purse string suture of braided silk and the deltoid muscle was then sutured to the border of the trapezius.

The vertebral edges of the destroyed supraspinatus and infraspinatus muscles were sutured to scar tissue and to the levator capulae and rhomboideus major and minor muscles. The skin wound was readily closed over the defect without skin grafting. Two drains were inserted. The arm was immobilized in 90° abduction in a plaster body spica.

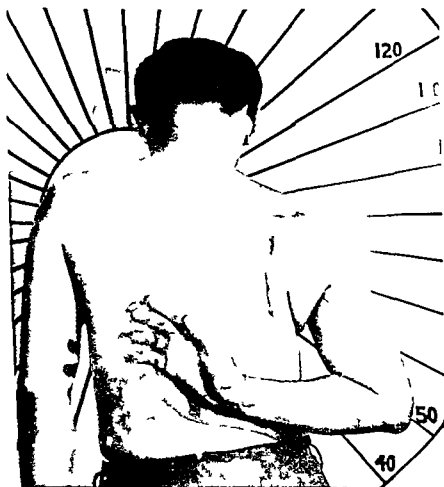


Fig. 5. Eighteen months postoperative view showing scar and good angle of motion with normal internal rotation.

The postoperative period was uneventful except for pain. The drains were removed on the third postoperative day. Drainage was minimal. The wound healed primarily with the exception of one area 2 by 2 cm which healed rapidly by secondary intention. The patient remained in the spica for one month and physiotherapy was started. The pathologic diagnosis of the operative specimen was nonspecific acute and chronic osteomyelitis.

Four months after the operation the patient was working as a hairdresser with only a slight handicap. The wounds were well healed and body contour was essentially normal. He had gained weight and was able to comb his hair and shave with his right

hand Range of motion was 90° abduction and 90° flexion Both internal and external rotation were normal Strength in all ranges had reached functional levels

Eighteen months after the operation arm function had improved in all aspects The range of motion was good with 180° abduction (fig 3) and 120° forward flexion (fig 4) Internal and external rotation were normal (fig 5) Objective strength tests revealed strength in the right upper extremity to be in the range of 25 to 30 percent of that in the left The results of this test are shown in table 1

TABLE 1 Objective strength (percent of normal pound)

	L ft (lb)	R ft (lb)
Abduction 90° slowly	10	3
Abduction 180° passively	10	
Forward flexion 180°	10	3
Spin weight 90°		
from medial to lateral	15	5
from lateral to medial	20	8

The patient is now able to work every day as a hairdresser with no serious limitations

DISCUSSION

Although *Endamoeba histolytica* could not be demonstrated by our study of tissue removed or by stool examination it is believed that this is a case of amebiasis cutis involving the scapula complicating amebic liver abscess The establishment of the diagnosis of amebic liver abscess in February 1957 by the patient's physician together with a positive complement fixation test on this hospitalization supports our conclusion The course of antiamebic therapy prior to our studies may account for our negative findings

Hepatitis or liver abscess are the most commonly occurring complications of amebic infection The incidence varies from one to 21 percent depending on the series reported The pathogenesis of this complication has been adequately discussed elsewhere A further complication of liver abscess is pleuropulmonary involvement which occurs in five to 15 percent of liver abscesses The manner of spread is generally by direct extension although hematogenous spread may oc-

cur^{10 12} Other complications of amebic abscess include perforation of the abdominal wall or other viscera, and hemorrhage

Of all the complications of amebic dysentery or liver abscess, so called amebiasis cutis is one of the rarest In 1941 Wyatt and Buchholz¹³ reviewed the literature and found that 28 cases had been collected In January 1951 Kreutzer¹⁴ reported he had found less than 50 proved cases of this condition Wilson and Hurewitz¹⁵ reviewed the literature in 1946 and reported one case Amebiasis cutis has been variously classified, usually according to cause and pathogenesis^{13 14 16} as follows

Following liver abscess, usually with surgical drainage

Following colostomy or the spontaneous rupture of a viscus, such as a fecal fistula

With perianal involvement due to fecal spread

With no demonstrable viscus connection

Of these, surgical drainage is the usual inciting causative factor In our case the scapula involvement rapidly followed the surgical drainage The elevated diaphragm right lower lobe atelectasis, and extrapleural pocket strongly suggest this to be a manifestation of direct extension

DeBakey and Ochsner¹⁷ studied 263 of their own cases of amebic hepatitis in 1951 and reported sterile abscesses in 77.9 percent as compared with 87.7 percent of 864 collected cases Amebas in the stools could be demonstrated in 45 percent of their own cases whereas in a series of 4,445 collected cases amebas were demonstrated in the stools of only 15.4 percent¹⁷ Craig⁹ pointed out that if repeated stool examinations are done amebas can usually be demonstrated, except in amebic abscess of the liver or of other tissues which develop after the primary infection has been eradicated In such cases the complement fixation test is valuable and often diagnostic⁹ McDearman and Dunham¹⁸ in 1952 reviewed 2,592 cases of amebiasis and reported a positive complement fixation in 86 percent of the extra intestinal cases The complement fixation test of the patient reported was positive several months after adequate amebacidal therapy

The commonest sites of amebiasis cutis are the abdominal wall and the perianal area Craig quoted Fletcher's review in 1903 mentioning one case in which the abscess ruptured into the muscles of the back Our case is reported as a unique and unusual location heretofore not referred to in the literature

SUMMARY AND CONCLUSIONS

In a case of complete scapulectomy including the glenoid and acromion range of motion reached 180° abduction and 120° flexion with normal internal and external rotation. Strength in all ranges was at functional levels. *E. histolytica* was considered the underlying causative organism combined with secondary osteomyelitis that destroyed the scapula. A histolytic infection of the skin is an uncommon disease and specific involvement of the scapula has not heretofore been reported. Total scapulectomy can be performed with reasonable expectation of satisfactory results when the muscles remaining are properly approximated.

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TUMORLIKE KERATOSES

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IN 1939 Poth¹ reported an unusual case of tumorlike keratoses developing on the dorsa of the hands of a 45 year old white man. The patient had suffered a severe sunburn to the dorsa of his hands which lasted about 10 days. Shortly thereafter the patient noticed six small growths on the back of his left hand and one on the back of his right hand. The lesions on the dorsum of the left hand corresponded exactly to the holes in a golf glove worn on that hand.² They attained varying sizes up to 2 cm in length, 1.5 cm in width and 1 cm in height but one lesion became as large as a cherry. Clinically these lesions appeared to be round, firm and translucent, or pearly carcinomas.

Examination of microscopic sections by six histopathologists however, resulted in conflicting opinions. Three of the examiners believed that the lesions were histologically squamous cell carcinoma, one reported an "exuberant verruca vulgaris" one stated the appearance to be one of dyskeratosis and marked hyperkeratosis.³ Doctor Weidman reported that the histologic appearance was that of a verruca vulgaris whose summits had been invaginated to a notable distance, and around which the retained keratinous materials had accumulated as though in a cyst. His diagnosis was "tumorlike senile keratosis."

These tumors increased in size and the center gradually was replaced by a hard keratotic mass resulting in an umbilicated lesion. Involution without treatment, of all lesions was complete in about eight months.

This patient had had two similar occurrences previously. On one occasion he sustained a severe sunburn which was followed by multiple lesions in all the areas which were exposed.

In 1952 Fliegelman and Loveman³ recorded a second case of tumorlike keratoses. Their patient was a 75 year old blacksmith who had worked outdoors for many years. In 1942 he first noticed a warty growth on the dorsum of his left hand and shortly thereafter several other similar lesions developed. These lesions dis-

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Presented at the annual meeting of the American Academy of Dermatology and Syphilology, Chicago, Ill., 9 December 1953.

appeared after several months. In 1948 he again noticed a warty growth develop on the back of his left hand and regress of its own accord in several months. The patient did not recall any lesions which had developed previously on the right hand. Being right-handed he normally held the left hand closer to the fire.

During the summer of 1949 when he was out of doors he noted the slow growth of numerous tumorlike lesions over the dorsum of each hand and wrist. In February 1950 Fliegelman and Love man found four tumors on the dorsum of his left hand and 12 or 13 on the dorsum of the right hand and wrist. They were all roughly circular and firm and several had a pearly appearance. Several had umbilicated centers, a few were crusted but most of them showed moderately thick scaling. None appeared on an inflammatory base and there was no regional adenopathy.

Differential diagnosis included squamous cell carcinoma, unusual verruca vulgaris, or possible nodular neurodermatitis. A few became cystic and when incised sebaceouslike material could easily be expressed. By the end of two years all lesions had involuted. The largest of them left superficial white atrophic reticulated scars whereas the smaller ones left none.

A biopsy and case report was submitted to Poth who agreed that this was the first case since his original report that parallels his case both clinically and histologically.

A third case having over 200 widely distributed lesions is here presented.

CASE REPORT

A 54 year old white man had worked for the past six or seven years as a carpenter and painter. Most of his work was out of doors. He had not worn a hat in 15 or 20 years and worked without shirt wearing breechclothes under a shirt from the waist up. About three and one half years ago he noticed a small firm asymptomatic tumor on the left forehead at the hairline. This lesion grew slowly reaching a maximum size of about 1.5 cm before gradually involuting leaving a slightly depressed pearly white scar with a zone of peripheral hyperpigmentation. During the time many other similar tumors were slowly developing first on the forehead then on the eyebrows, nuchae, V of the neck, arms, and dorsa of the hands. As the older lesions gradually disappeared new lesions would appear beginning as small red bumps. He stated that the tumors were more numerous in the summertime and following a day at the beach, he would appear in a crop.

There was no familial history of similar lesions. For the past five years he had had postoperative drainage aggravated by glycosuria. It is believed that alcohol may be a factor in these complaints.

Physical examination on admission to the hospital on 26 January 1953 showed two types of cutaneous lesions. Numerous superficial pliable blue white scars some with a ring of remaining keratosis and others with peripheral pigmentation were scattered over the forehead ears cheeks neck shoulders V of the neck and deltoid areas of the arms. The first thought in the minds of several examiners was that these lesions were atypical discoid lupus erythematosus. Over the



Figure 1 Three stages of lesions are apparent. Immediately beneath the ear is the early pigmented phase. Below this is the plaque stage and over the ramus of the mandible is the light atrophic scar. The borders of the active lesions are elevated over the center and purplish red in appearance.

forearms especially the extensor surfaces and the dorsa of the hands were very numerous round or oval heaped up keratotic nodular lesions covered with a tight mica-like scale. They varied from pinhead size to 1.5 cm in diameter. All phases of evolution and involution were apparent the involution beginning centrally and spreading slowly to the periphery (fig. 1). On the dorsum of the left hand several had coalesced. These lesions most resembled hypertrophic lichen planus (fig. 2).

Four representative tumors were removed for histologic examination. Doctor Weidman's report was as follows:

Several different lesions were examined histologically. The order of pathologic change was the same in all the only important difference being in the degree of verrucosity and hyperkeratosis.

Thus the surface of the skin was verrucous and hyperkeratotic in extreme case the accumulation was indeed great comparing with that of cutaneous horn in some case. The rest of the epidermis was most irregularly thickened with prolongations downward which were bizarre and extreme. In spite of this the basement membrane remained intact and the epithelial cells were excellently differentiated.



Figure 2. Individual lesions on the forearms and upper arms of a patient with lichen planus. Note the characteristic flat-topped, polygonal, and often grouped lesions on the dorsal aspect of the arms.



Figure 3 The histologic picture is that of senile keratosis but without any cancerous infiltrative features (Hematoxylin and eosin stain $\times 30$)

and oriented. There was not any semblance of a cancerous type of cellular hyperplasia. Keratinization of individual cells was surprisingly scanty. In short conditions in the epidermis resembled those of senile keratosis (fig 3) and without any precancerous features histologically (fig 4) much less cancerous ones. The nests of hyperkeratotic material were not genuine pearly bodies but represented simply the accumulations within deeper recesses between the verrucosities.

In the corium an extensive and fairly dense inflammatory cell infiltrate had developed below the epidermis and extended fairly deeply. This is comparable once again to what develops in senile keratosis.

Telangiectases were associated but they were small ones and were not nearly as numerous as what might be expected where clinically such a conspicuous purple areola surrounded the lesion.

The tissue change are reasonably those of a light enzootic dermatosis known what we do of pathogenesis and the histology of sunburn to say nothing of the clinical background of Pith's tumorlike keratosis.

Laboratory studies indicated normal values for blood cell counts, hemoglobin, sedimentation rate, and blood proteins, albumin, globulin.

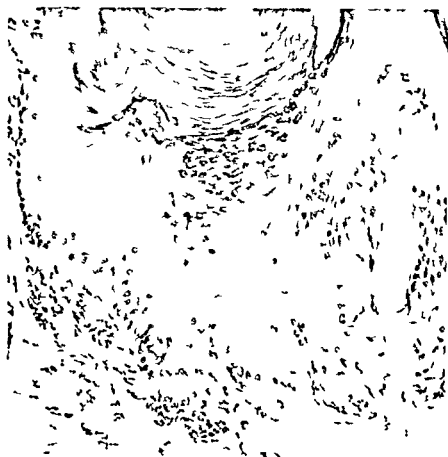


Fig. 4. This is the most actively hyperplastic part of the two sister pyramidal tumors in the deep parts. (H. Mat. 145)

ratio and routine urinalysis. Liver function tests and liver biopsy indicated a nodular regenerative phase of cirrhosis following hepatitis.

Two determinations of total 17 ketosteroids were reported 3 mg and 5.4 mg per 24 hours.

The urinary creatinine was 3.9 mg per 24 hours.

Attempts to reproduce typical lesions with ultraviolet light were unsuccessful after (a) a single exposure of 20 minutes duration (b)

a beginning exposure of five seconds increasing five seconds daily for 60 days the last day's exposure amounting to five minutes and (c) a daily exposure of four minutes for 60 days. All exposures were with the Hanovia Luxor Ultraviolet Alpine Lamp at 30 inches through a two-by-four-inch aperture in a rubber sheet. This was a relatively new lamp with an intense output at 30 inches of ultraviolet radiation of wavelengths of 3132 angstroms and shorter. At this distance in normal persons a first-degree erythema is obtained in 24 seconds and a fourth degree erythema occurs after six minutes.

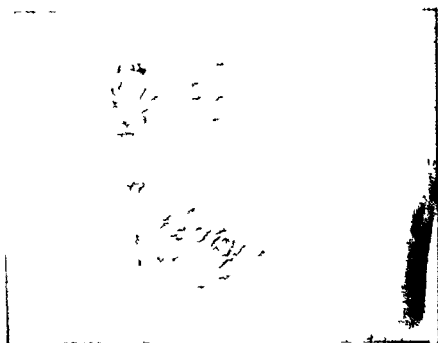


Figure 5 Test site on right deltoid area on fifty-fifth day of exposure to four minutes of ultraviolet radiation daily. Note the thickening of the epidermis with moderate pigmentation.

To determine if trauma was a part of the mechanism pricking of the skin of the back followed by a single intensive exposure to sunlight for 20 minutes was performed. When the initial erythema subsided there was no evidence of the trauma produced by perforating the skin into the dermis.

The right deltoid area which received a daily exposure of four minutes for 60 days did not develop vesicles at any time but did become very erythematous. After 14 days small flat keratotic lesions were noted, which gradually progressed up to a centimeter in size. Upon discontinuance of the test after 60 days however there was no typical raised or nodular lesion (Fig. 5) and on histologic examination there was only evidence of chronic dermatitis. Three months after discontinuance of radiation there was no more pigmentation of the area than in surrounding skin although there were small cystlike papules in this area thicker than in the corresponding area of the other arm or adjacent skin surface.

The area on the back which received five second increased exposure daily for 60 days up to a maximum of five minutes on the sixtieth day developed keratotic lesions but not as marked as on the arm. Examination of this area three months later showed some pigmentation but no lesions of any kind (fig 6). This was the only test site to have much residual pigmentation.

Protection from the ultraviolet radiation was obtained when paraaminobenzoic acid in concentrations of from five to 20 percent in a water soluble base were applied to the skin the exposure time being 20 minutes.

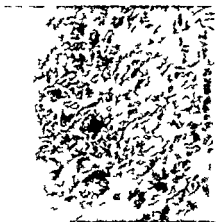


Fig. 6. The test area on the back exposed to five second ultraviolet light for 60 days. No tumor has developed.

The patient tended to rub the lesions gently with his finger nail. No excoriation was noted but this may have contributed to the mic like scale. An occlusive dressing held in place for three weeks with a wire frame to keep pressure off a test site on the dorsum of the forearm resulted in some regression of the mic like scale but no other changes were noted.

Although the patient was kept entirely indoors during daylight hours all the lesions did not disappear and a small number of new lesions appeared from time to time. The patient was discharged four months from service with about half the number of lesions on his forearm and dorsum of hands as he had on admission and with no active lesions on the face and neck.

Three months later the patient stated that he had worked outdoors and occasionally visited the seashore during the summer. For the first two months he wore hat and white shirt and kept all exposed surfaces and previously colored areas of the shoulders covered with a protective paraaminobenzoic acid preparation. At the end of the second month he had used all of the protective cream but continued

to wear a hat and white shirt. His skin had cleared with the exception of the scarring on the scalp, neck and deloid areas and a few slight skin-colored elevations on the dorsa of his hands and extensive surfaces of his forearms. After he discontinued the protective cream the prurigo-like lesions reappeared, these apparently being the early stage of the plaque or tumorlike lesions. The previously involved areas except the scalp and forehead were found to have a moderate scattering of prurigo-like lesions but no nodular, keratotic lesions. It is known that ultraviolet light can penetrate an ordinary white shirt to some extent.

COMMENT

Clinically the lesions in my patient and in those of Poth¹ and Friegelman and Loveman² seem to be due to the influence of sunlight. The lesions on the dorsa of the hands and wrists were similar. They were nodular, keratotic, tended to umbilication and healed from the center outward. In the first case¹ the summit of the lesion appeared invaginated histologically and keratinous materials had accumulated as though in a cyst. In the second case² some of the lesions actually appeared cystic or crusted and when incised a sebaceouslike material was easily expressed. In the patient reported here no such cystlike formation was noted either clinically or histologically. In all three patients involution occurred without treatment. The present patient is unusual because of the extreme distribution of his lesions, the clinical appearance of discoid lupus erythematosus of the lesions of the scalp, neck and shoulders and of hypertrophic lichen planus or a nodular neurodermatitis on his forearms. Individually a few of the lesions on the dorsa of the hands could have been mistaken for carcinoma on clinical examination.

REVIEW OF LITERATURE

Where to place the tumorlike keratoses in the scheme of light-sensitive dermatoses is an interesting speculation. Willan in 1798 described *eczema solare* and suggested sensitivity to sunlight. Bazin in 1860 gave the name *hydroa* to a group of bullous lesions precipitated by sunlight and *prurigo aestivalis* was described by Hutchinson in 1888 as summer prurigo.

In 1942 Epstein reported studies on 17 patients with abnormal human sensitivity to light and discussed *prurigo aestivalis*, *eczema solare* and *urticaria photogenica*. Of his 17 patients "11 had only one clinical entity, seven had to be classified as combination or transition types and two of these showed at various times the characteristics of all three forms of light sensitivity. These combinations occurred all too frequently to be considered a chance result." It was believed that heredity and sex-linked characteristics were common factors in these conditions.

Lamb and associates presented a classification of patients with these lesions. Under the heading of polymorphic light-sensitive eruptions the following conditions were listed: plaque-like type, contact eczematous type, papular and prurigo-like type, and erythematous type (erythema solare perstans). There was overlapping of the clinical variants with transitional stages and combinations of the different types of lesions. About 75 percent of the patients with solar dermatitis presented plaque-like lesions.

Kesten and Slatkin presented a rather extensive classification of diseases related to light sensitivity. One group occurred in skin after prolonged exposure to sunlight. In discussing this article Lamb said: Dr. Kesten's series of patients with various light dermatoses were carefully studied to determine the action spectra of wavelengths inducing the light sensitivity in each disease, but the ability to reproduce the lesions in each disease was disappointing, as it was in our series. In our plaque-like types we could not reproduce the lesions with a single exposure to the various action spectra, but we felt that the plaques were produced by repeated solar injuries from many exposures.

Much has been written in the past decade concerning the relationship of the steroid hormones and the light-sensitive eruptions. Lamb and coworkers and Morgan and others have contributed much factual information upon the role of the liver and the steroids. In an article on steroid hormones, Lamb and associates mention six men with polymorphic photosensitive eruptions who presented moderately depressed or low 17-ketosteroid excretion accompanied with creatinuria during active stages of the eruption. Minimal doses of estrone effected cures of two young girls with hydroa vacciniforme. It was suggested that in the group of diseases presented: i.e., lupus erythematosus, dermatomyositis, and polymorphic light-sensitive eruptions, there is evidence of disturbed steroid and protein metabolism, as evidenced by abnormal creatinine, creatine, and 17-ketosteroid excretion. Creatinuria is present in a number of diverse pathologic conditions and cannot be considered diagnostic. Its significance in these eruptions remains to be seen. There is little evidence to prove that the porphyrins are related to photosensitivity in man.¹ Hormone excretion in patients with chronic liver disease has been studied by various groups.

The role of the androgens in the mechanism of tanning of the skin is not understood, yet the production of testicular hormones must play a decisive part. Andrews cited a case of a boy who had had both testicles removed at the age of eight. He had never tanned and was the fair blond type. At the age of 14 he was exposed to sunlight while clad in bathing trunks. A week after exposure to sunlight he was given an injection of testosterone

for the first time. The area exposed to the sunlight is heavily pigmented. The abdominal and lumbar regions are 20 times as sensitive as the face and hands.¹⁸

Hall¹⁷ points out that the role of pigment in the protective filtering mechanism is apparently not as great as is supposed. While pigment may be the most important factor in protection of the Negro skin from the carcinogenic rays of the sun, it is not so for the white skin. In the latter most of the pigment that is formed in the basal layer "drops off" into the stratum corneum and thus does not become interspersed between the cells of the basal layer, where it might contribute some degree of protection to the prickle cell layer. Although it is true that the pigment finds its way toward the surface, this is not sufficient in the white skin to afford much protection. The principal protective factor may be the thickening of the stratum corneum which follows exposure to sunlight.¹⁹ Minder²⁰ showed that the stratum corneum may thicken as fivefold or sixfold in response to exposure to ultraviolet radiation. The thick horny layer of the skin absorbs light in the ultraviolet part of the spectrum, and the granular layers reflect and scatter light thus preventing it from reaching the sensitive prickle cell layer.

Multiple primary squamous-celled carcinomas of spontaneous healing have been reported from time to time. Familial occurrences have been noted by Charteris²¹ and Ville and Vilne.²²

To further add to the problem it appears that self-healing basal cell epitheliomas. In addition to the spontaneously healing basal cell epitheliomas reported by Murtula,⁷ reported spontaneous regression of basal cell carcinomas with eventual atrophy. Some 100 lesions have been reported over a period of years.

Rook and Whimster² reported on 29 patients with a tumor, an entity first described by MacCormack in 1936 under the designation of molluscum sebaceum. It is solitary, found usually on the face or neck, and reaches maximum size of 1.5 cm to 2 cm in diameter, and duration as a rule does not exceed six months. At the onset of its growth it appears to be a round nodule covered by a tight and bright epidermis. The center of the nodule may be covered by a crust which is easily removed, revealing a crater filled with cornified material. The authors believe that this tumor is cancerous or precancerous, and may sometime during its existence resemble a basaloid or spinocellulare—squamous cell carcinoma of

Sulzberger³ reviewed some facts about chemical carcinogens that possibly could be expanded to include the carcinogenic effect of sunlight or the altered chemistry of the skin in response to sunlight. His views were that there is the equivalent of an incubation period required for the development of the specific malignant tissue reaction to the chemical no matter how powerful the agent or susceptible the animal that certain species or individuals are much more susceptible to a chemical carcinogen while other species strains or individuals do not develop cancer no matter how intense the noxa that there is evidence of localized fixed areas of particular susceptibility to the specific action of the chemical (in tarring the back of a mouse only certain spots begin to develop carcinomas and never the entire skin surface that has been tarred) and that the specific reaction to the chemical carcinogen apparently takes place first and principally in the epithelium."

DISCUSSION

Three cases of tumorlike keratoses have been reviewed and in each there is a definite relationship to exposure to sunlight. It is possible that when the initial lesions were noticed by the patients there had been a chronic exposure which resulted in the formation of the tumorlike keratoses similar to the formation of senile keratoses. If a sensitivity developed during chronic exposure it would seem to be activated by an acute sunburn. In this connection Hopkins' remarks in discussion of a case of xeroderma pigmentosum will bear repeating. The term hypersensitivity to light should be used with reservation in regard to this disease. That these patients are not hypersensitive to light in the ordinary sense is well illustrated in this case in which rather an excessive exposure to ultraviolet rays was required to produce erythema. It is more of an altered reaction to light. Whether that is another form of hypersensitivity that is a delayed reaction with hyperkeratosis and disturbance of pigment is a question. The atrophy and keratosis which these patients exhibit would not be exhibited by a normal person except after years of chronic exposure to light. That seems to be quite different from the thing we ordinarily speak of as light sensitivity. The determination of zone sensitivity is both interesting and practical.

It is interesting to note that the present patient can tolerate up to and possibly more than 90 minutes of ultraviolet light of wavelengths of 3132 angstroms and shorter while control subjects received an apparent erythema and subjective symptoms greater than the subjects on five minutes exposure.

Lamb and associates gave a possible explanation of the causes of solar eczema on the basis of physical allergy as sug-

gested "by the fact that in a few of the patients an immune reaction to sunlight was observed. After the initial exposure in the spring to sunlight, a severe exacerbation of the lesions occurred, but later in the summer only mild responses were evoked."

In the present case pigmentation, if any, was very slight with the pruriginous lesions remaining in the test area of the medial surface on the right arm three months after cessation of the daily four minute exposure to ultraviolet light. The area on the back, on which ultraviolet radiation was increased five seconds daily to a maximum of five minutes on the sixtieth day, showed moderately strong pigmentation without visible lesions three months after cessation of treatment, which indicates a different sort of reactivity. This latter test area was just below the top of the underwear and probably had not been exposed to as much light previously as had the area on the arm.

No mention of the steroids, creatinuria, and liver function was made in the other reports of tumorlike keratoses. This patient did show low 17 ketosteroid urinary excretion levels and no increase in creatinuria. The liver involvement with probable high alcoholic liquor consumption together with the low 17 ketosteroid output, may be significant in the production of his lesions.

The status of the tumorlike keratoses is not established, but certain resemblances to epitheliomas are noted. In most cases the lesions appear on the exposed skin surfaces, as do the light-sensitive eruptions. Poth's, and Fliegelman and Loveman's cases, as in the self-healing squamous cell epitheliomas and the keratoacanthomas, showed histologic evidence of cyst formation. A sebaceouslike material was expressed from the lesions in Fliegelman and Loveman's patient, as could be done in some of the patients reported in the self-healing epitheliomas.

Levy and associates²¹ reported six cases of keratoacanthoma, the first to be reported in the American literature. They used the term synonymously with the terms molluscum sebaceum and molluscum pseudocarcinomatousum and stated that the keratoacanthoma may be related to the multiple self-healing epithelioma²² and tumorlike keratosis.² The multiplicity of lesions, however, plus the actinic background of the latter serve to differentiate these conditions.

The mechanism of retrogression of the tumorlike keratoses is not understood. If sunlight is not continued, they tend to disappear leaving scars. It may be that, as in the self-healing squamous cell epitheliomas, the longer the tumorlike keratoses exist, the less will their tendency to retrogress be apparent.

It may be that the position of the tumorlike keratoses is somewhere between the polymorphic plaque-like light-sensitive eruption

tions and the self healing squamous cell epitheliomas and the keratoacanthomas

Some believe that recession in a self healing process of a true squamous cell cancer does not exist. Their belief that if a lesion disappears it is not a true cancer is similar to the belief that if pemphigus is reported cured it was not true pemphigus

It seems logical in any event to protect the patient's skin from actinic radiation including x ray and radium therapy. The skin conceivably could react adversely to such therapy even on reduced dosage and true squamous cell cancer could eventually appear at the irradiated sites. There being no contraindications preparations of quinacrine hydrochloride (atebrin) chloroquine phosphate or para aminobenzoic acid should be given orally as a therapeutic trial

SUMMARY

A case of tumorlike keratoses has been presented with a review of two previously reported cases. The tissue changes appear to be those of a light sensitization dermatosis and undoubtedly benign. Protection from actinic radiation however is indicated.

A partial review of the status of the plaque-like polymorphic light-sensitive eruptions, the keratoacanthomas and the self healing squamous cell epitheliomas is given and the need for further identification and study to clarify the relationship of these conditions is stressed.

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In general most cases of defective speech are handled best by full co-operation between the dentist physician orthodontist and speech therapist There are however many cases of defective speech which can be corrected by the general dentist if he supplements his knowledge of the dental sciences with some knowledge of speech production

—HOWARD E KESSLER D D S
in *Journal of the American
Dental Associat*
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SENSITIVITY OF BETA HEMOLYTIC STREPTOCOCCUS TO VARIOUS ANTIBIOTICS

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IN a self limited disease such as acute tonsillitis or pharyngitis clinical evaluation of antibiotic therapy is difficult. A recent report indicates that untreated patients with streptococcal sore throat have symptoms only a few hours longer than those treated with penicillin or aureomycin hydrochloride. The present study was made to determine by testing with antibiotic sensitivity disks the comparative resistance or sensitivity of beta hemolytic streptococci to various antibiotics. Disks of carbomycin (magnamycin) chloramphenicol (chloromycetin) aureomycin hydrochloride oxytetracycline (terramycin) penicillin and streptomycin were selected for this purpose.

Because there is a high rate of acute upper respiratory disease at this Air Force base throat cultures were performed on every male patient admitted to the adult medical wards with acute tonsillitis and pharyngitis in the early months of 1954. Beta hemolytic streptococcus was obtained in every instance. From this group the cultures of 110 consecutive patients were selected for the sensitivity tests. The technic of culturing and sensitivity testing followed the method of Spaulding and Anderson.

The patients ranged in age from 18 to 43 years the majority being under 25 years. The disease developed during hospitalization in three patients. Twenty three patients were afebrile on admission of the others 21 had temperatures above 102° F. Initial leukocyte counts were above 15,000 in 15 patients. Neutrophils were over 70 percent in 60 instances. Exudate was present in 47 patients. Tonsillectomies had been performed in 37 persons. Of the remaining 16 had no apparent tonsillar hypertrophy while the rest had varying degrees of enlargement. Anterior cervical nodes were frequently enlarged and tender. The enlargement in 26 was negligible in 41 slight in 31 moderate and in 12 marked. Sixty one had at least one form of complicating illness. Complications and their frequency of occurrence were: Acute sinusitis 23 acute bronchitis 18 herpes simplex 14 gastroenteritis 11 acute laryngitis five and other complica-

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TABLE 1 Incidence of sinusitis in relation to tonsillar conditions in 110 patients with acute tonsillitis and pharyngitis

Sinusitis	Number of patients with tonsillectomies	Number of patients with no tonsillar hypertrophy	Number of patients with tonsillar hypertrophy (degrees of involvement)				Total
			1	2	3	4	
Acute first attack	4	0	6	0	0	0	10
Acute attack plus previous attack	7	1	1	1	2	1	13
Previous attacks only	8	1	9	5	2	0	25
Sinusitis-free	18	14	13	11	5	1	62
Total	37	16	29	17	9	2	110

tions 13 Three patients had marked edema of the uvula and peritonsillar tissues

Of the 23 persons with acute sinusitis, 10 had had no previous known attacks Twenty five of the 38 patients with a history of sinusitis had no appreciable sinus infection with their present illness Table 1 shows the relation of sinusitis to tonsillectomy and tonsillar hypertrophy Sinusitis was somewhat more common in patients who had had tonsillectomies Acute sinusitis occurred in 11 of 37 patients with tonsillectomies (30 percent) and in 12 of 73 with tonsils present (16 percent) Previous attacks of sinusitis were recorded in 15 of 37 patients with tonsillectomies (41 percent) and in 23 of 73 without (32 percent) Sinusitis had preceded operation in only two of the 15 who had had tonsillectomies

TABLE 2 Antibiotic sensitivity of beta hemolytic streptococci from tonsils of patients with tonsillitis

Antibiotic	Grade of sensitivity					Total
	0	1	2	3	4	
Carbonyl	3	10	33	56	8	110
Chl. meph. l.	0	0	0	4	106	110
Aureomycin hydrochloride	0	0	3	4	103	110
Oxytetracycline	0	1	8	10	91	110
Penicillin	8	7	13	35	47	110
Streptomycin	100	9	0	0	1	110
Total number of strains	111	27	57	109	356	660
Antibiotic sensitivity profile						

Antibiotic therapy consisted of 600 000 units of penicillin procaine daily in 96 patients aureomycin hydrochloride in nine and oxytetracycline in five The latter two drugs were used when the patient had a history of sensitivity to penicillin or when penicillin had been unsuccessfully used on a previous occasion Of those receiving penicillin one was changed to aureomycin hydrochloride because of a penicillin reaction Nine others were given aureomycin hydrochloride after apparent therapeutic failure of penicillin One of this group was later changed to oxytetracycline

Sensitivity of the cultured beta hemolytic streptococcus to various antibiotics was graded 0 1 2 3 and 4 plus according to the zone of inhibited growth Composite tabulation of all sensitivities is given in table 2

An evaluation of the nine patients who were poorly responsive to penicillin showed that eight had at least one concurrent disease. Accompanying illnesses in these patients were three cases of acute sinusitis, two of acute bronchitis, and one each of peritonsillar abscess, dermatophytosis, cellulitis, duodenal ulcer, infectious mononucleosis, and hemorrhoids. From two of the nine patients hemolytic staphylococcus was grown on culture, while cultures from five of the whole group of 110 contained staphylococcus. Sensitivities to penicillin in the nine patients were graded 3 plus in four, 2 plus in three, 1 plus in one and 0 in one.

Seven of the eight patients whose streptococcus was graded 0 were started on penicillin, and only one failed to respond clinically. The other six had brief periods of hospitalization of from three to five days. This lack of correlation between sensitivity tests and clinical response has been previously reported.^{2,3}

SUMMARY AND CONCLUSIONS

Cultures performed on 110 consecutive adult male patients, admitted with acute tonsillitis and pharyngitis, revealed beta hemolytic streptococcus in every instance. Disk sensitivity tests were performed on the streptococci found. In vitro studies indicated that the broad spectrum antibiotics were more efficacious than penicillin. Most patients were treated with penicillin, however, and the response was adequate despite resistant strains on testing. Complicating and concurrent diseases were more common in the group who required more than one antibiotic. The clinical response of these patients with acute tonsillitis and pharyngitis could not be gauged by in vitro studies of the sensitivity of the bacteria cultured to the antibiotic used.

It has been emphasized that the disk method measures bacteriostasis and not bacteriocidal activity, and that penicillin is rapidly bacteriocidal for many bacteria.² These facts explain the clinical cures in patients whose bacteria were found resistant to penicillin.

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A NONREBREATHING VALVE FOR USE IN INHALATION THERAPY AND ANESTHESIA IN THE ADULT

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RECENT developments in anesthesia and inhalation therapy have produced a definite need for more adequate methods of administering gases and volatile drugs to adults by means of a nonrebreathing system. Such a technic following the methods proposed by Leigh and Belton and Stephen and Slater has been used for children for several years but the advantages of its use for adults have only recently become fully appreciated.

It is interesting to note that as early as 1847 Snow illustrated a nonrebreathing valve system which he used in anesthetizing adults but apparently the use of such a system did not become widespread. With the increased use of trichloroethylene anesthesia during the past decade together with the desire for refinements in methods of inhalation therapy the need for a satisfactory nonrebreathing valve system for adults has become apparent. Several commercially made valves of this type are now available but some of these have undesirable features which tend to make their use inconvenient and at times hazardous. To overcome these deficiencies a relatively simple and inexpensive nonrebreathing valve has been constructed from readily available parts.

USE IN INHALATION THERAPY

A nonrebreathing valve system has been found to be advantageous for use not only in anesthesia but also in many forms of inhalation therapy on the various hospital services. In oxygen therapy such a system is capable of producing high concentrations of inhaled oxygen while eliminating the possibility of carbon dioxide accumulation due to rebreathing of expired gases. With the wide selection of sizes and shapes of anesthesia masks

F m B k Army H p t l F r t S m H o n T C a p t . C i w g d n o
U S A i r F H o p i K i A i F B a s e M i s s

available today, most of which may be readily fitted to the non-rebreathing valve, a more satisfactory fitting of the individual patient's face is possible than with the fewer styles presently available for oxygen therapy. By means of a simple adapter the valve may be fitted to a tracheotomy tube when needed. Water, alcohol, or other vapors may be administered through the valve if desired and mixtures of oxygen with helium, carbon dioxide or other gases may be used.

USE IN ANESTHESIA

Nonbreathing or open systems as used in anesthesia provide many distinct advantages which as compared with their few disadvantages frequently make them the method of choice for adults as well as children. When properly constructed to meet the requirements of a true nonbreathing system such a valve will prevent the accumulation of carbon dioxide without necessitating the use of, or frequent inspection of the soda lime canister. There is physiologic dissipation of body heat with a nonbreathing system, and much of the dead-air space which can occur with some absorption methods is eliminated with a nonbreathing valve. Because a reservoir bag is used with this system estimation of the patient's tidal exchange is possible and assisting or controlling of the respirations is facilitated.

Disadvantages of the nonbreathing valve system are those of any open system of anesthesia. Because large flows of gases are required (averaging five to 10 liters per minute in the adult) such a method would be prohibitive with the more expensive gases although when nitrous oxide and oxygen are used with a volatile agent this factor is not significant. As with any open system, an explosion hazard exists when inflammable agents are used.

USE WITH TRICHLOROETHYLENE

Most of the common volatile and gaseous anesthetic agents may be used with nonbreathing systems including ether, vinyl ether (vinethene), trichloroethylene, nitrous oxide, ethylene, and cyclopropane although the latter two are not usually employed in such a system because of the explosion hazard and the expense involved. Our interest in the nonbreathing valve was originally stimulated by the use of trichloroethylene as an agent for producing general anesthesia or analgesia because toxic compounds are produced when this agent is used with soda lime.

Following the development of a more satisfactory valve for adults trichloroethylene has assumed the role of the agent of choice in several surgical procedures. When used for endotracheal anesthesia the combination of trichloroethylene with nitrous

oxide and oxygen has given the clinical impression that there is a lower incidence of coughing than with other general anesthetic agents both immediately following intubation and during maintenance of light surgical anesthesia. This important feature combined with absence of the explosion hazard and rapid recovery with little or no nausea or vomiting, makes trichloroethylene ideally suited for those surgical procedures requiring light endotracheal anesthesia with only moderate relaxation especially for electrocoagulation or radiography when a quiet recovery period is desired.

SPECIFICATIONS FOR VALVES

Several commercially produced nonrebreathing valves were originally used at this hospital but were abandoned because of certain deficiencies. A respiratory valve for use in a nonrebreathing system for adults should meet several specifications. The valve should have a large surface area which offers little resistance to air flow but which assures reasonably tight closure during the opposing phase of respiration to prevent dilution of gases by room air or rebreathing of expired gases. The valvular orifice should be at least three quarters and preferably seven eighths of an inch in diameter. The opening pressure of the valve should be low because a valve may have little resistance to the air flow once it is open but may require considerable pressure for the initial opening especially when the surfaces become moist after use. The valve should be nonpositional; i. e. it should function adequately when placed in any position.

The construction of the complete nonrebreathing valve should be as simple as possible. Valve flaps should be accessible for cleaning and replacement when necessary and the valve should fit existing masks and endotracheal tube fittings. It should be mechanically designed so that eversion or inversion of one of the valve flaps cannot occur as has been seen during periods of hyperventilation with one model of commercial valve. Within the valve housing there should be a minimum of dead air space and provision should be made for occlusion of the expiratory valve when it is desired to assist respirations. The entire device should be reasonably small and lightweight.

Many of the commercial valves having been primarily designed for pediatric anesthesia have been found to be deficient in two or more of the desirable criteria. One recently described valve appears to fulfill most of the above requirements.

AN IMPROVED VALVE

The standard army gas mask expiratory valve was chosen for use in the unit to be described because it fulfills all of the above requirements and is readily obtainable in stores selling army

surplus goods Having been designed for use under combat conditions of exertion, the valve is capable of handling the large minute volumes of exchange occasionally occurring during hyper ventilation under anesthesia

As shown in the exploded view (fig 1A) the nonrebreathing valve consists essentially of three parts (1) Two gas mask valves (the expiratory valve being cut off at the back of the housing), (2) their rubber flaps, and (3) a cylindrical plastic housing

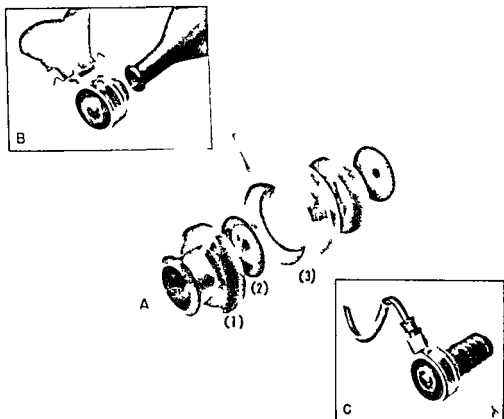


Figure 1 The nonrebreathing valve (A) An exploded view of the valve (B) The assembled valve fitted to the face mask and the reservoir bag (C) The assembled valve fitted to the endotracheal tube and the corrugated tubing leading to the reservoir bag mounted on the gas mask

with side-arm to hold the two valves The external diameter of the side arm is of the correct size and taper to receive standard anesthesia masks and the internal diameter of the side-arm is of the correct size and taper to receive standard endotracheal tube connections As shown in the two assembled views* (fig 1,B and C) the inspiratory valve may be connected either directly to a tailed rubber anesthesia reservoir bag or indirectly via a

This illustration was made with the cooperation of Lt Col Stephen F Smolyak DC USA Chief of the Plastic Eye Section, Brooke Army Hospital

servations recorded no attempt has been made to analyze this preliminary data statistically but in all observations the valve described in this article exhibited resistance (as measured by pressure) equal to or less than the commercial units tested. In contrast with the hinged rubber flap type of valve the gas mask valve has been found to eliminate the waste of gases because of leakage around the expiratory valve flap as well as to prevent rebreathing due to an incompetent inspiratory valve.

When it is desired to use this or any other nonbreathing valve for inhalation therapy it is imperative that the patient be observed and the gas flow regulated to prevent the sudden emptying of the reservoir bag due to either depletion of the gas supply or increased respiratory minute volume. The valve may be further modified for safe use without constant attention by including a spring loaded flap safety valve within the plastic valve housing to admit room air in the event of such an occurrence.

SUMMARY

The indications for the use of nonbreathing valve systems in inhalation therapy and anesthesia are briefly reviewed together with the advantages and disadvantages of the method. The desirable specifications for such a valve are presented and the shortcomings of some currently available valves in meeting these criteria are mentioned. An improved nonbreathing valve which meets these requirements is described. The valve and a mask employing it may be relatively easily constructed from readily available materials. An accessory device is described which may be attached to the valves to simplify administration of artificial respiration. A clinical and experimental comparison of this valve with other available valves has shown it to excel in several respects.

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CEPHALOMETRIC ROENTGENOGRAPHY

Its Value and Uses in a Military Hospital

WILLIAM L. LAWTHER *Captain, D.C. USAR*

CEPHALOMETRIC roentgenograms are routinely made on all patients treated in the orthodontic clinic of this hospital. Downs analysis of skeletal and denture patterns is used as an aid in the diagnosis and treatment planning. As treatment progresses additional cephalometric records are made to measure the amount of tooth improvement and developmental growth as well as to determine the normalcy of position and the angulation of the developing teeth in the maxilla and mandible.

USE IN PROSTHODONTIA

Cephalometric records are helpful in prosthodontia.¹ Lateral cephalometric roentgenograms made with an exposure to give good soft tissue outlines are excellent pre-extraction records for patients requiring a full denture.

In the cephalometric roentgenogram the occlusal vertical dimension, the position and angulation of the upper central incisors, and the plane of occlusion are recorded simultaneously. A tracing of this is then made, transferred to a piece of cardboard, and a profile template obtained which is adjusted to fit the patient's profile from forehead to below the chin. A horizontal line at the vertical height of the incisal edge of the maxillary first incisor is drawn on the profile record and is called the incisal edge line. The distance from this tooth to a point along the incisal edge line is carefully recorded. Another line paralleling the angulation of the maxillary incisor is drawn on the profile record, and a line paralleling the relative position of the mandibular incisors and vertical height is included. This records the horizontal and vertical overjet for each patient. By using this profile record during the construction of dentures, the operator can maintain the same vertical dimensions and the same positions of the incisors as existed in the natural dentition.

The cephalometer makes it possible to obtain an accurate profile of the patient. Without a head positioner and fixed x-ray tubes, it is easy to distort the roentgenogram by a slight change in the angulation of the x-rays to the head or to the film.

CEPHALOMETRICS IN ORAL SURGERY

In oral surgical diagnosis cephalometrics is of help in locating foreign bodies in the head and about the face in assessing traumatic bone loss and in estimating preoperatively the amount of bone needed for replacement. It also aids in the preparation of tantalum trays (splints) used to stabilize bone grafts in restoring facial contour and symmetry. Its greatest value however has been in an evaluation of developmental deformities and in planning their surgical correction.

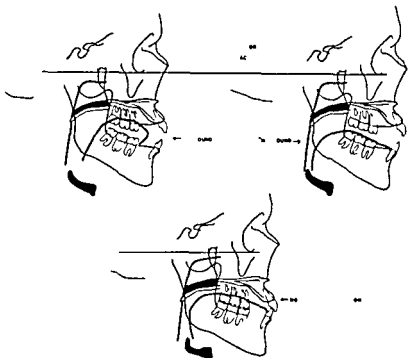


Figure 3 Tracing of cephalometric roentgenogram showing the position of the tracing guide and with the tracing guide removed.

A new operation for the correction of extreme mandibular prognathism has been developed by Caldwell and Letterman as a direct result of preoperative cephalometric analysis. By studying tracings of lateral cephalograms they devised a vertical osteotomy in the mandibular ramus which has many advantages over other operative procedures. This operation is illustrated in figure 4 in which it will be noted that not only has the protrusion of the jaw been corrected but also the angle of the mandible restored to relative normal contour from the deforming obtuse angle observed in the preoperative tracing.

The application of cephalometric records has also been most helpful in evaluating surgical patients during their postoperative courses. An example is illustrated in figure 5. A patient with extreme prognathism was treated by horizontal osteotomy above the mandibular foramen. The amount of change following surgical

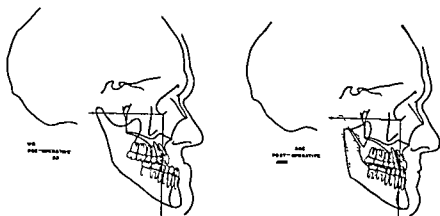


Figure 4. Tracings of cephalometric roentgenograms taken before and after the surgical correction of mandibular prognathism. A vertical osteotomy in the mandibular ramus was performed.

correction can be accurately recorded and evaluated by comparative cephalograms. In this case there was an appreciable movement of the parts as evidenced in the tracings made two months after operation. The broken line represents the position of the mandible immediately following operation and the solid line shows its position at the subsequent date. The tendency of the temporal muscle to displace the proximal fragment forward and upward with concurrent open bite anteriorly is demonstrated.

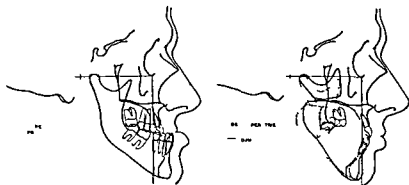


Figure 5. Tracings of cephalometric roentgenograms taken before and after the surgical correction of a mandibular prognathism. A horizontal osteotomy of the mandibular ramus was performed on this patient. The illustration on the right shows the superpositioning of the tracings of two positions at the cephalometric examinations, showing the amount of change that had taken place in the two months following the operation.

These examples of the application of cephalometric records in oral surgical diagnosis and procedures are practical and illustrate the benefits which may be derived from scientific roentgenographic analysis of surgical problems

USE OF CEPHALOMETRIC RECORDS IN DIAGNOSTIC PROBLEMS

Cephalometric records can be an adjunct in the diagnosis of many clinical problems. They can be used to advantage in endocrine disturbance such as acromegaly. An analysis can be made as to the size of the bones of the face especially the relative size of the mandible to the rest of the face. A distinguishing

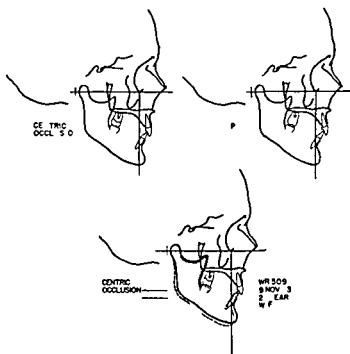


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feature of acromegaly is a prognathic mandible. Another area to be noted is the sella turcica of the sphenoid bone. By comparison of the two records made several months apart, one can ascertain any unusual amount of bone change. Cephalometric appraisal of course is not the only method of diagnosing acromegaly, but it can be of help in the full analysis of a patient in whom this condition is suspected.

In the past year 57 patients with temporomandibular joint difficulties have been examined at this dental clinic. Postero-anterior and lateral cephalometric roentgenograms were made with the patient's jaws in centric occlusion, physiologic rest position, and wide open. The lateral roentgenogram of the patient with his mouth wide open, was used to trace the head of the condyle. By comparing tracings of the lateral roentgenogram of the centric occlusion and physiologic rest positions, the path of closure was determined.

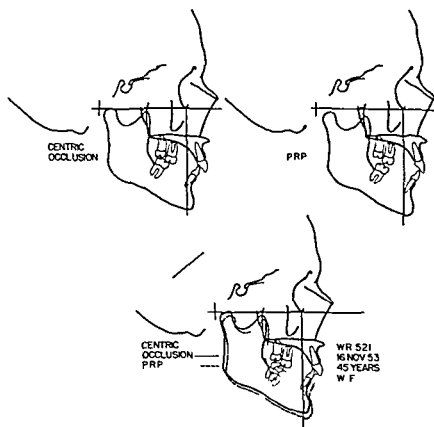


Figure 7 Tracings of cephalometric roentgenograms showing an abnormal closing movement: a bodily movement of the whole mandible upward and backward.

According to Thompson the movement of the mandible from the rest position to occlusion is a hinge movement with the axis of the hinge being the center of the condyle. The mandibular incisors move in an arc, upward and forward when closing (fig 6). When opening the jaws beyond the rest position, the center of the condyle ceases to be the axis of the hinge and the condyle moves downward and forward. When there is a deviation from the normal upward and forward path of closure, discomfort is often experienced in the temporomandibular joint.

When cephalometric roentgenograms show a deviation from the normal path of closure (fig. 7) proper clinical procedures are initiated to eliminate the cause. Two of the most common causes are premature contact (fig. 8) and loss of vertical dimension in the molar and bicuspid area due to attrition. When there is a loss of vertical dimension in the molar and bicuspid area the incisors articulate first, the mandible moves upward and backward the hinge action of the condyle is lost and the condyle also moves upward and backward causing abnormal strain on the ligaments and musculature and increases the pressures in the glenoid fossa.

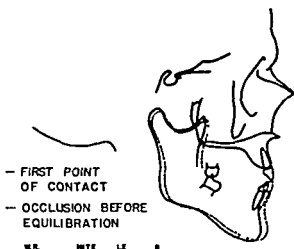


Fig. 8. Lateral cephalometric roentgenogram showing abnormal incisal contact due to premature contact of the molar and bicuspid area.

A comparison of the centric and physiologic rest position by lateral roentgenograms also gives a measure of the freeway space. A freeway space which exceeds the normal limits can often be a factor in a temporomandibular joint difficulty. The excessive amount of freeway space is similar to the loss of vertical dimension difficulty stated previously, the difference being that the first point of contact does not have to be in the incisor area nor does there have to be any prematurity of contact. The path of closure can be in the right direction but goes too far before the

teeth are in occlusion This places the muscles of mastication under an abnormal strain and causes an increase in pressure in the glenoid fossa When the corrective measures have been taken, cephalometric roentgenograms can again be made to determine if the closing movement is normal

Thirty three of the 57 patients who were evaluated in the cephalometric department were referred from dental clinics at other military installations The evaluations of the cephalometric roentgenograms were sent back to the dental clinic that had referred the patients Treatment programs were then carried out in those clinics

Of the remaining 24 patients seven were found to exhibit normal paths of closure and the freeway space was found to be within normal limits Three of these patients had maxillary sinus and inner ear infections which were believed to be the cause of the discomfort in the area of the temporomandibular joints Two had had fractures of the maxillary bone on the affected side and the complaints of the other two were believed to be on a functional basis

Seventeen patients were treated in the main dental clinic at this hospital Eight of these had an abnormal path of closure of varying degrees such as seen in figure 7 Occlusal equilibration brought relief and restored the path of closure to the normal hinge action (fig 6) Two patients had a normal path of closure except for a deviation of the mandible to the right in centric occlusion Occlusal equilibration corrected this and brought relief In six patients the cephalometric roentgenograms showed a loss in the vertical dimension which was restored first with temporary splints This brought relief and they are being replaced with permanent bridges crowns and partial dentures In one patient the temporomandibular joint discomfort followed a subluxation of the joint This patient exhibited a normal path of closure and a normal freeway space His mandible was immobilized for six weeks with intermaxillary wiring and this brought relief

SUMMARY

The field of cephalometric roentgenography as a clinical aid in dentistry and medicine is quite new in the Army This hospital is one of the few where a cephalometer has been installed

The value of cephalometric roentgenograms lies in the fact that all roentgenograms so obtained are standardized as to the position of the patient's head and source of x ray This makes possible the assessment of a clinical patient as compared with the average normal person as established cephalometrically It is also possible to make serial cephalometric records so that the results of different clinical procedures such as prosthetics,

orthodontics surgical procedures et cetera can be compared with the pretreatment records Serial cephalometric records can be made of a child in order to follow his growth and the development and eruption of his teeth Standards of growth and development have been established cephalometrically for the different age levels of children By an early detection of a deviation from the standard in growth and development, or positions of erupting teeth corrective measures can be taken to minimize the condition

More and more uses are being found for cephalometric appraisals of clinical patients The cephalometer continues to be a valuable research instrument in studying growth and development effects of treatment and in studying normal functions of the temporomandibular joint soft palate and tongue

In time the cephalometer may prove indispensable to the dental and medical professions as a clinical aid and as a research instrument.

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THE FIFTH MIDDLE EAST MEDICAL ASSEMBLY

The Secretary of Defense has been informed through the American Embassy at Beirut that the Fifth Middle East Medical Assembly will be held at the American University in Beirut Lebanon 22-24 April 1955

Medical officers of the Army Navy and Air Force have participated in earlier assemblies of this group presenting papers and generally contributing to the program The last meeting in April 1954 was attended by nearly 100 physicians most of whom were general practitioners Medical officers of the three services are again invited to contribute to the program in April 1955

Physicians desiring to participate in this international meeting should submit the request through their respective departments in the usual manner

THE MEDICAL CORPS OF THE ARMY AND SCIENTIFIC MEDICINE

MERRITTE W IRELAND *Major General MC USA*

ALL who know the history of American Medicine and of the Army Medical Corps know that the two are very intimately related, often, especially in times of war, so blended as to be practically one and the same. It has always been our nation's policy to maintain only a small standing army in times of peace and to rely on militia, volunteer and, more recently, reserve troops to augment the force in time of war. Likewise the Medical Corps is a small body. It has consisted of as few as 53 members. It now has 983. It is always reinforced in war time by doctors drawn from civil life. In the World War, as you know, the services of practically the entire profession were at the disposal of the government, and no small part of the medical men were actually taken into the Medical Corps. The same thing was true in less degree in the Civil War.

I am limiting my discussion to the contributions of the regular Medical Corps, and to contributions made by men in active service. The Corps was regularly organized by law and was given a head, or surgeon general in 1818. Since that time its history has been continuous, and always it has done credit to the American profession. Usually it has used the remedies and methods of the general profession. When the latter made an advance, the army advanced with it. Occasionally it has led the profession. The earliest examples of this are found in the work of Surgeon General Joseph Lovell who was appointed to that position in 1818. At that time the relationship between weather and disease was thought to be closer than we think it today. Surgeon General Lovell initiated a system of observations and reports of weather at all military stations by the medical officers stationed there.

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This constituted the only weather service of the country for more than half a century. In 1839 a summary of the reports was published by Surgeon General Lawson Lovell's successor. Other summaries were published later. In 1870 the Signal Corps which was the creation of a medical officer Surgeon Albert J. Myer who became its first head took over the meteorological work to surrender it in turn to the Weather Bureau organized in the Department of Agriculture in 1890. However the weather service in this country is a definite contribution to science by the Medical Corps.

Simultaneously with the weather reports appeared a Statistical Report on the Sickness and Mortality of the Army of the United States for the period January 1, 1819 to January 1839. It was compiled from the periodical and special reports which Lovell had demanded from his medical officers. While not a great contribution to scientific medicine it presents a most interesting and vivid picture of the medicine and the America of that period the time when bleeding, mercurial salivation, tartar emetic and alcohol were the great standbys in practically all diseases. And it shows that the doctors of that day were as much convinced that they were doing good and effecting wonderful cures as we are in this day of serum therapy, chemotherapy, hormones and radiations. Apparently yellow fever could then be prevented by bleeding and salivation as it now can be by prevention of mosquito bites.

Dr. Lovell was also a pioneer in the promotion of temperance in the army. Alcoholism was far too common and its effects were terrible. Lovell thought the rum ration a source of harm as it undoubtedly was and after much insistence and agitation on his part it was abolished. Unhappily alcoholism was not abolished with it. Nevertheless the alcoholism of the present day is rare and mild as compared with that of a century ago.

In 1849 Surgeon Charles Tripler reported of Detroit Barracks: To realize the frightful intemperance of the men stationed here one must see it. If permitted to go on unrestrained this command will soon be decimated. The buildings occupied as barracks are accessible to whiskey smugglers at all points. No troops have constitutions capable of standing such persevering intemperance; they must be quartered differently or they must die.

Serving under Lovell and encouraged by him was America's first and one of her greatest contributors to scientific medicine. This was Assistant Surgeon William Beaumont. Like many of the medical men of his day, Beaumont was not a graduate of medicine and had never attended a medical school. He read medicine with a preceptor and was licensed to practice by the

Third Medical Society of Vermont as by law established, on the second Tuesday of June, 1812 " As war was beginning, he applied for a place as medical officer and was appointed a surgeon's mate in December, 1812 He served throughout the war



The Signal Corp of the Army was created in 1863 through the efforts of a Medical Corp officer Brigade General Albert J. Myer (1828-1880) who was the first Chief Signal Officer

and was continued in the service after its close, but tiring of the life he resigned After a period of practice and storekeeping, he again entered the service in 1820 and was sent to Fort Mackinac Michigan Territory That was then a far northwestern frontier post much visited by Indians and French Canadian voyageurs whose recreation was often found in drink Violence was not rare

June 6 1822 a young Canadian, Alexis St Martin, was accidentally shot in the left side at a distance of two or three

feet The full charge of buckshot struck the left side passing forward and outward destroying the integuments more than the size of the palm of a man's hand blowing off and fracturing the sixth rib from about the middle anteriorly fracturing the fifth rupturing the lower portion of the left lobe of the lungs and lacerating the stomach by a spicula of the rib that was blown through its coat lodging the charge wadding fire in among the



J ph L. Bell (1788-1836) pp 1 d the J S Geo G 1 of the
U S Army 1818 and died mil 1836

fractured ribs and lacerated muscles and integuments and burning the clothing and flesh to a crisp The man survived and was cared for by Beaumont through a stormy convalescence which was prolonged for almost two full years Most of this time was spent in Beaumont's house as the man was a pauper and helpless He recovered with a gastric fistula through which it was possible to observe the interior of his stomach Such ob-

servations were begun by Beaumont and were carried on at intervals until 1833 St Martin was by nature a wanderer, illiterate and not interested in science, and for long periods he would disappear. Nevertheless, he lived to be an old man and the father of 20 children. Osler planned to secure his stomach for the Army Medical Museum, but when St Martin died in 1880, Osler received a telegram which read "Don't come for autopsy, will be killed," and St Martin's neighbors guarded his grave at night. Beaumont spent much effort and money to get hold of St Martin from time to time. In 1824 he sent the first report of his observations to Surgeon General Lovell, who encouraged him to continue his work and helped him in many ways.

In 1833, Beaumont published at Plattsburgh, "Printed by F P Allen" his *Experiments and Observations on the Gastric Juice, and the Physiology of Digestion*, a book now the most prized of medical Americana, then containing "The most important contributions to the physiology of digestion made during the century" (Harvey Cushing "Life of Osler"). I cannot forbear quoting a sentence from his introduction: "My opinions may be doubted, denied, or approved, according as they conflict or agree with the opinions of each individual who may read them but their worth will be best determined by the foundations on which they rest—the incontrovertible facts." Can there be a better test of scientific worth?

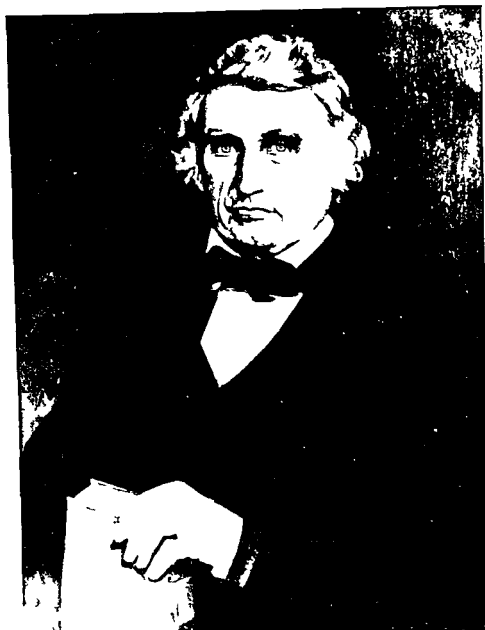
Beaumont's incontrovertible facts, his observations and experiments, have not been controverted to this day. Some of his conclusions have been controverted, as he and all others of that day knew nothing of pancreatic and intestinal digestion, he had not all the facts. Even so of the 51 "inferences" which he published at the end of his book, fully 90 percent are today as incontrovertible as his facts. Any of us whose batting average remains as high after a century of experimental testing and criticism will probably be considered real scientists. One of his errors was the belief that the gastric juice acted on all foods in the same way, to produce what he called "gastrite of aliment."

From Beaumont's day to the Civil War, the Corps made no notable contributions to medicine. It went along doing its duty in garrison and field, in peace and war. It fought scurvy, malaria, typhoid, dysentery and diarrhea as well as Indians, Mexicans, and official neglect. It very promptly adopted the use of ether anesthesia, which eased the sufferings of the wounded in the Mexican War. Always it was unprepared for war, like the rest of the Army, because of the national attitude. However, in 1859 it planned and adopted the use of ambulances, thereby setting an example for civil hospitals to follow later.

The Civil War brought forward two extraordinary medical officers whose contributions to the practice of military medicine were great and beneficent although perhaps not so much to be called scientific as practical contributions. These men were Surgeon General William A. Hammond and Surgeon Jonathan Letterman who was the Medical Director of the Army of the Potomac long enough to put into effect many and great reforms. These men worked together and together they effected a complete revolution and a great improvement in the methods of evacuation of the wounded from the battlefield in field hospitalization in hospital administration and in the service of medical supplies. Their work served as a model for later medical organizations in our own and most European armies. In addition Surgeon General Hammond ordered the keeping of records and the rendition of reports which later constituted the material for the Medical and Surgical History of the War of the Rebellion which in its day was considered a very great contribution to science. He ordered the collection of material for an Army Medical Museum. He made many sound and valuable recommendations which were adopted only after the lapse of years and which today testify to his wisdom. Not least of his sound contributions to medicine was his action in cutting calomel and tartar emetic from the supply table of the army. Today that seems a small matter worthy of a smile. It probably did as much to free American medicine from a harmful and ignorant past as any act of that period. It was then orthodox to ascribe wonderful curative properties to mercurial salivation and to mild antimonial poisoning and the profession raised a great row over Hammond's action. He was forced to compromise to the extent of allowing the drugs to be drawn on special requisition but his action was of great significance. Venesection had already largely passed and of the four big remedies of our fathers the four horsemen of the Apocalypse only alcohol held an undisputed sway after Hammond's order.

As the result of quarrels with Secretary Stanton Surgeon General Hammond was dismissed from the service and Surgeon Letterman resigned at about the same time. Hammond was succeeded as surgeon general by Joseph K. Barnes who held the position until 1867. He carried forward the good work begun by Hammond and added to it. He had prepared and published the "Medical and Surgical History of the War of the Rebellion" wisely selecting as editors Surgeons Woodward, Otis and Huntington. The publication was hailed abroad and in this country as marking a very important contribution to medicine and surgery.

General Barnes also took into his office Assistant Surgeon John Shaw Billings. Billings catalogued the library of the office.



*Assistant Surgeon William Baumgartner (1785-1853) obtained Alexander Stewart's
gastric fistula at interval from 1822 until 1833*

That first catalog, dated 1864, was of 24 duodecimo pages, and it listed 472 books classified as follows:

Anatomy, 25 titles; physiology, 13; materia medica, 18; pathology and practice of medicine, 113; surgery, 105; midwifery and diseases of women and children, 18; medical jurisprudence and toxicology, 6; hygiene and medical police, 18; natural philosophy, chemistry, and natural history, 71; reviews, and so forth, 34; reports and statistics, 34; dictionaries, encyclopedias, maps and so forth, 17.

After the close of the Civil War and the numerous general hospitals which it had necessitated Surgeon General Barnes had left in his possession a large sum of money the general hospital fund a fund from which special diets and other necessities not furnished by the Government for the sick could be purchased. He allotted \$80 000 of this money for the improvement of the library secured annual appropriations from Congress and put Dr Billings in charge of the work. It was a task after Billings' own heart. The man and the job had met. For 30 years Billings was librarian and from the small beginning, already cited he made the library of the Surgeon General's Office the greatest medical library in America possibly the greatest in the world. Whether it has more medical books and papers than any other library in the world may admit of some doubt. That what it has are more accessible for use admits of none. For Billings began and carried forward until his retirement the two greatest bibliographic labors ever undertaken for medicine the Index Catalogue of the Library and the Index Medicus. The Index Catalogue lists the medical literature of the world as classified and filed in the library. It has completed two alphabetical series and the third series to include the letter P and thus far it embraces 45 volumes of royal octavo size and from 400 to 1 500 pages each. This catalogue is in use throughout the civilized world and is possibly America's greatest contribution to medicine.

As a period of 15 or 20 years is necessary for the completion of an alphabetical series a given subject for example typhoid fever will appear but once in that time. To supplement the Catalogue and to enable the investigator to locate references to his subject in the current literature Billings started the Index Medicus a monthly index of the new medical books and articles appearing throughout the world. The Index Catalogue has always been a government publication but the Index Medicus never was. Life was therefore a struggle for it and it always lost money. At present it is continued in the Quarterly Cumulative Index Medicus of the American Medical Association. It is a necessity and a blessing to the medical investigator and writer.

But Billings' great contributions to medicine were not limited to these. He was a writer on medical history and a teacher of hygiene. In 1869-1870 he was detailed to make a survey of the Marine Hospital Service which was then not a credit to the profession but was the sport of politics and the spoils system. Billings' survey was followed by recommendations which were adopted and which initiated the improvement and growth which have resulted in the present splendid Public Health Service.

In 1875 he began to plan the Johns Hopkins Hospital. His plans included buildings, organization, and administration including the teaching of medicine and surgery and the selection of the very remarkable group of men who were the institution's first chiefs. Billings planned to have it equal or excel any similar institution in the world, and from its opening it has stood



George M. Sternberg (1838-1915) a pioneer American bacteriologist and contemporary of Pasteur founded the Army Medical School when he became Surgeon General in 1893. He served in this office until 1902.

at the very front of medical teaching and investigation. I doubt if any other American has done so much for the promotion of medicine as did John S. Billings.

The Army's next great contributor to scientific medicine was George M. Sternberg, who was surgeon general from 1893 to 1902.

He was the American pioneer in bacteriology and a life long worker for public health. He discovered the pneumococcus independently of and almost simultaneously with Pasteur. Pasteur called it *Microbe septicomique du saliva* while Sternberg named it *Micrococcus Pasteuri*. Sternberg was a prolific and informing writer on the subject of bacteriology from about 1880 and his *Manual of Bacteriology* issued in 1893 was a landmark of the science in America.

In 1893 also without any legal authorization General Sternberg established the Army Medical School using rooms in the building which housed the Library and Museum and detailing the faculty from officers having other duties in Washington. I believe that I may fairly claim that this was the first school of hygiene in America as well as a school of military medicine.

Throughout most of his career General Sternberg was a student of and a writer on yellow fever. Much of his work was the refutation of the mistakes of other workers and it was of great value as indicating that the germ was not to be found by the ordinary bacteriologic methods. It was he who appointed the board of which Walter Reed was president to study yellow fever in Cuba after the Spanish American War.

Sternberg's leadership in scientific medicine received recognition through many honorary degrees and the presidency of both the American Public Health Association and the American Medical Association.

In spite of Sternberg's scientific attainments the Medical Corps like the rest of the medical world was not too far advanced in knowledge of sanitation and disease prevention when we went to war with Spain while our lack of military preparation equalled that of the rest of the Army and the country generally. The results were deplorable. Typhoid fever ravaged all of our home camps and many of those overseas. It was aided in Cuba by yellow fever and malaria to such an extent that the generals with the army reported that *This army must be moved at once or it will perish*. From this sad experience there resulted an interest in and study of epidemiology which brought forth great benefits. Typhoid fever had been regarded not in the army alone but by the medical world as a water borne disease and great care had been exercised to assure good water supplies in all our camps of concentration. When the disease nevertheless became widespread a board of medical officers (the Reed-Vaughan-Shakespeare Board) was appointed to study it. This board found that the epidemic in the various camps were not water borne and it blamed flies, dust, camp pollution and tent infection for the spread of the disease. Unfortunately nothing was then known

of healthy bacillus carriers, of the dangers to be feared from the man in the incubation stage of the disease, nor of food contamination and resulting company epidemics, and the means of control initiated were consequently defective. When the Boer War came, the British had experiences with typhoid quite as distressing and painful as ours had been. Meanwhile, however, advances had been made in the study of immunity and attempts at bacterial prophylaxis were undertaken in South Africa. They were not highly successful, but were enough so to encourage later continued experimentation in the British Army in India. By 1908 the results were sufficiently promising to lead Surgeon General O'Reilly to have Major F. F. Russell sent to England and Germany to investigate the subject. On his return he submitted a report on the epidemiology and control of the disease. A board of eminent members of the newly constituted Medical Reserve Corps was convened to consider the subject, and it recommended the use of typhoid vaccine in the Army. Also, by this time, there had grown up a considerable literature on the very important epidemiologic features of typhoid carriers and kitchen epidemics. This new knowledge was applied simultaneously with the use of vaccines, and typhoid fever diminished so rapidly that in a few years it became a rarity in the army and we may look forward to continuous freedom from it on any large scale. From being the greatest scourge of armies and one of the greatest of America it has become relatively rare and seems doomed to disappear. Our army deserves much credit for its early and effective application of knowledge to practice in bringing this about. It really showed the way to the rest of the world.

Meanwhile, largely as a result of the Spanish American War, it was confronted by diseases which were largely new and strange to it, cholera, plague, yellow fever, beri beri, while such old enemies as malaria, dysentery, and smallpox raged in our tropical possessions as they had not done in our America since the Civil War. Boards for the study of tropical diseases were appointed in Cuba, Porto Rico and the Philippine Islands and from all of them came very valuable work. From Porto Rico came Bailey K. Ashford's identification of the tropical anemia of that island, with hookworm disease. From the Philippines came valuable contributions on plague, cholera, and intestinal infections and parasites but all of these were overshadowed in importance and in popular and professional estimation by the work on yellow fever by the board in Cuba under the presidency of Major Walter Reed. That work solved the problem which had baffled the investigators of a century and threw so much light on the epidemiology of yellow fever as to enable man to control it to abolish

it from the ports of all America to hope for its ultimate extinction from the world. The findings of the board were as follows:

1 The mosquito—*C. fasciatus*—serves as the intermediate host for the parasite of yellow fever.

2 Yellow fever is transmitted to the nonimmune individual by means of the bite of the mosquito that has previously fed on the blood of those sick with this disease.

3 An interval of about 12 days or more after contamination appears to be necessary before the mosquito is capable of conveying the infection.

4 The bite of the mosquito at an earlier period after contamination does not appear to confer any immunity against a subsequent attack.

5 Yellow fever can also be experimentally produced by the subcutaneous injection of blood taken from the general circulation during the first and second days of this disease.

6 An attack of yellow fever produced by the bite of the mosquito confers immunity against the subsequent injection of the blood of an individual suffering from the nonexperimental form of this disease.

7 The period of incubation in 13 cases of experimental yellow fever has varied from 41 hours to five days and 17 hours.

8 Yellow fever is not conveyed by fomites and hence disinfection of articles of clothing, bedding, or merchandise supposedly contaminated by contact with those sick with this disease is unnecessary.

9 A house may be said to be infected with yellow fever only when there are present within its walls contaminated mosquitoes capable of conveying the parasite of this disease.

10 The spread of yellow fever can be most effectually controlled by measures directed to the destruction of mosquitoes and the protection of the sick against the bites of these insects.

11 While the mode of propagation of yellow fever has now been definitely determined, the specific cause of this disease remains to be discovered.

Sir Patrick Manson later wrote:

These experiments fully explain. First, the impunity with which a yellow fever patient can be visited by a nonimmune if outside the endemic area; the mosquitoes in the vicinity are not infective. Second, the danger of visiting the endemic area especially at night; the mosquitoes there are infective and active.

third the discrepancy between the incubation period, three to five days of the disease, and the incubation period, 14 days and over, of an epidemic the necessary evolution of the germ in the mosquitoes infected by the original introducing patient demanding the space of time indicated by the difference between



Major Walter Reed (1851-1902) most eminent of the conquerors of yellow fever, died of appendicitis; Washington D.C. a year after completing his work in Cuba.

these two periods fourth, the clinging of yellow fever infection to ships buildings and localities the persistence of the germ in infected mosquitoes which are known to be capable of surviving for five months, and probably longer after feeding on blood fifth the high atmospheric temperature required for its

demic extension of yellow fever such temperature favors the activities and propagation of the mosquito and is probably necessary for the evolution of the germ in the mosquito "

It was America's great good fortune to have as governor general in Cuba a former member of the Medical Corps Major General Leonard Wood His knowledge of medicine and of the importance of epidemiology caused him to make possible the labors of the Reed Board to which he furnished money facilities and moral support After the Board had published its findings he made it possible for Major William C Gorgas Chief Health Officer in Cuba to make practical application of the knowledge an application so successful as to add very striking and popularly convincing proof of its correctness Gorgas soon followed this with an even more convincing demonstration on the Isthmus of Panama thereby making possible the construction of the Panama Canal without a too extravagant expenditure of lives and treasure His work in Havana and in Panama made Gorgas the best known sanitarian in the world and led to his being called into consultation on sanitary problems by various foreign governments and to his appointment as surgeon general at the end of 1913 He retained that position until his retirement for age in 1918 and his great prestige and popularity was a large factor in rallying the whole profession to the aid of the Medical Department However I do not wish to appear to claim that all credit for control of yellow fever belongs to Reed and Gorgas They have enough to enshrine their memories among the great benefactors of mankind and to justify the Medical Department's great pride in them But the discoveries in regard to yellow fever like many great discoveries were rather evolutionary than revelational Reed had knowledge of four important facts which linked together led directly to the crucial experimentation which his board undertook

Ronald Ross of the Indian Medical Service had shown that malaria is transmitted by anopheline mosquitoes that the parasite undergoes an important phase of its life cycle sexual multiplication in the insect and that until the completion of this phase the insect cannot transmit the disease

Dr Henry R Carter of the Public Health Service had published his important observations on the epidemiology of yellow fever showing the relationship between imported and secondary cases in a neighborhood a relationship suggesting to Reed the probability of insect transmission in view of Ross work

Dr Carlos Finlay a prominent physician of Havana had for 20 years been maintaining that yellow fever was conveyed by

the bite of a certain mosquito, *Culex fasciata* He was breeding the mosquito and he furnished Reed with its eggs

The American Administration in Cuba had cleaned up the city of Havana without improving the yellow fever situation, thus showing that the disease was not a "filth disease "



Major General Merritt Webb Ireland the author of this article was Surgeon General of the Army from 1918 until 1931 He died in Washington D C. on 2 July 1952 at the age of 85

Walter Reed had knowledge of these facts and recognized them as highly significant He set his Board to test out Finlay's hypothesis in the light of the work of Ross and Carter The results were fairly prompt and wholly convincing So complete and convincing was it, that it seemed that all was known of the

disease that could be known Yet more has been learned since the Indian monkey was shown susceptible to the disease and probably the most interesting item in this later information is the demonstration that hyperimmunization of monkeys to the disease by repeated injections of yellow fever liver may eventually kill the animal in the same way that real yellow fever infection kills with black vomit jaundice and collapse This opens up large fields for investigation and research It is likely that all diseases show as many symptoms due to the body's resistance as to the direct action of germs of disease But in how many is the bodily resistance the killing factor? Would it not be worth our while in some instances to study means for slowing up resistance?

On the other side of the world in the Philippines the Army has done notable work in public health and sanitation Its tropical disease boards have put out important work on many subjects especially dengue beri beri malaria intestinal parasites surra in horses and rinderpest in cattle Most notable and striking however was the sensational control of beri beri a disease which wrought havoc among our Filipino troops and prisoners This disease was prevalent through all the warm Far East The Japanese Navy in which it had been very prevalent had been freed from it by a change of ration English Dutch and French medical men in the East had studied the disease and had brought forth much evidence that it was related to a diet consisting mainly of highly milled rice that from which the pericarp had been removed in the process of milling In 1909 Captain James M Phalen and Captain Edwin D Kilbourne constituting the Tropical Disease Board in Manila at that time recommended a change in the ration of the Philippine Scouts as follows the substitution of undermilled for highly milled rice reduction of the rice ration from 20 to 16 ounces the substitution of 16 ounces of beans for 4 ounces of rice taken away and prohibition of savings on the meat component Beri beri underwent a sharp and early reduction the admissions of Scouts to sick report for that disease falling from 604 in 1909 to 20 in 1910 and two in 1911 and it has been absent or practically so since Similar results were obtained in the Philippine constabulary in the prisons and the leper colony and beri beri was demonstrated to be a deprivation disease due to insufficiency of the water soluble vitamin B This work was a boon to the Philippines and a very important step in preventive medicine

To my long time friend and assistant Brigadier General Carl R Darnall the world is indebted for the use of liquid chlorine in the purification of water supplies a method used by cities generally

The outstanding medical historian of America is Colonel Fielding H Garrison and the most important work on the subject is his "History of Medicine," which has been published in its fourth enlarged and revised edition. It is a perfect mine of information, a reference book of permanent value, and is very interesting.

I believe, too, that a departmental publication, "The Medical Department in the World War," the story of our and your great medical effort will prove of lasting value. It is too large and detailed for light reading, but it will be a great help to all interested in the history of medicine or of the World War.

Army men are also continuously contributing to the more valuable type of current medical literature. Such men as Craig, Keller, Vedder, Gentry and many others are among the leaders of the profession.

Will you excuse me if I boast that the Army continues to set an example in disease prevention that few other bodies have equalled? As proof I wish to quote a very few statistics from the sick reports of the first quarter of this century, in regard to diseases which I have not already considered. In 1901 the incidence of malaria in the Army was 708.52 per 1,000. In 1927, 6.73. In 1900 the rate for dysentery was 145.13 per 1,000. In 1926 it was 0.02.

In 1902 the rate for venereal disease was 160.94 per 1,000. In 1927 it was 49.73.

In 1902 the rate for rheumatic fever was 5.22 per 1,000. In 1926 it was 0.53.

For the year 1903 admissions for disease were 1,514.29. Admissions for all causes were 1,716.51. Deaths from disease were 12.78, and deaths from all causes were 15.49.

For the year 1927* admissions for disease were 526.78. Admissions for all causes were 644.24, deaths from disease were 2.35, and deaths from all causes were 4.00.

From primary bullet	for 1953 the Army has	reported the following rate
deaths from	419.31 admissions from	474.12 deaths from disease
0.46, deaths from	all causes, 1.79	—Editor

PREDICTION OF ADEQUACY FOR MILITARY SERVICE

Use of the Cornell Medical Index Health Questionnaire

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ONE measure of predicting a man's adequacy in future situations of stress is the number of medical and psychiatric symptoms he developed in response to past stresses. The study reported here on unselected men inducted into the Marine Corps relates aspects of each man's military career to the number of symptoms he reported on the Cornell Medical Index Health Questionnaire at preinduction examination. This study investigated the validity of predicting ability to withstand stresses in military services based on the number of medical and psychiatric complaints evoked by civilian life adjustments.

METHODS

The study takes its departure from an observation made during World War II that men who developed incapacitating medical and psychiatric symptoms in service often gave a history of similar symptoms in civilian life. This suggested that such men may be identified from their medical histories at preinduction examination.

The Instrument The Cornell Medical Index Health Questionnaire (CMI) a four page letter sized sheet containing 195 questions elicits a comprehensive medical history that includes the psychiatric aspects of disease. The respondent answers the questions by circling a yes or a no after each. In every instance a yes response indicates that the subject claims to have the symptom about which he is being questioned. It has been shown that responses on the CMI are the same as those to similar questions asked in oral interview.

The CMI may be interpreted either clinically by evaluating the significance of the responses - or statistically by counting the number of yes answers.¹ Both methods are effective in identifying people with emotional disturbances. Because it is

more rapid and independent of varying skills of different interpreters, the statistical method is used in this study. A "CMI score" is the number of "yes" responses on the CMI that is, the number of the respondent's medical and psychiatric complaints.

The Sample The sample was 783 unselected men who completed CMIs at the New York Induction Station during their preinduction examinations in September and November 1951, who were subsequently drafted into the Marine Corps, and who were followed in service for a period of one year. The sample in this study is truncated, that is, men found unfit by psychiatrists and physicians at preinduction examination were rejected; only men judged fit for service were included.

The data studied include the incidence of psychiatric discharge, medical discharge, and discharge before expiration of term of service; convictions by courts martial; absences without leave; hospitalizations; limited duty; overseas service; and wounds or death in action. Data from military careers were correlated with the self reports on the CMI at preinduction examination.

RESULTS

At the end of a year, of the 783 men studied, 558 had not been sent overseas and were in a fully active duty status within the continental United States, 90 were or had been fully active overseas, two were killed in action, two were missing in action, eight were wounded in action, five (including a conscientious objector) were on limited service, four had deserted and were absent from military control, 39 had been discharged for psychiatric reasons, 29 had received medical discharges, two had been discharged for fraudulent enlistments, two had been discharged for poor performance, five had received "hardship" discharges, two had received bad conduct discharges, nine were hospitalized preparatory to appearing before physical evaluation boards, one was suffering from "combat fatigue," and 25 were either in confinement or had suffered conviction by courts martial.

Table 1 compares the military behavior of 39 (five percent) marines with the greatest number of complaints (46 or more) on the CMI at preinduction examination with the other 744 (95 percent) who had 45 or fewer complaints. The five percent had a significantly higher percentage of psychiatric discharges but not medical discharges, than did the other 95 percent. In addition, the five percent of men with the highest CMI scores had a significantly greater percentage of discharges for all reasons other than expiration of term of enlistment, and of men no longer on fully active duty.

Of the 39 men with the highest CMI score (five percent of the sample) seven were discharged for psychiatric disability one for medical disability one for hardship one for cowardice in the face of the enemy one was under treatment for combat fatigue and one had been placed on limited service as a conscientious objector during this study. Thus within one year of induction almost one third of the men with the highest CMI scores were no longer performing fully effective military service.

Table 2 shows that significant differences with respect to the criteria of adequate military performance hold at cut-off levels other than five percent. That they hold over the entire range is shown by significant coefficients of correlation relating these aspects of military behavior to CMI scores. Men with many complaints on the CMI in general performed less adequately in service than did men with fewer complaints.

Of the 39 men discharged for psychiatric disabilities 60 percent had fewer than 26 complaints on the CMI. Generally men discharged with a diagnosis of schizophrenia had few yes responses while those diagnosed neurotic had many.

An analysis of the responses showed that some items make sharper distinctions than do others between men who performed adequately and those who did not. For example of the eight men who answered yes to item 168 (Did you ever have a nervous breakdown?) four received psychiatric discharges one received a medical discharge one was convicted by special court-martial and only two were still fully active at the time this survey was completed. Similarly of the five who answered yes to item 90 (Did you ever have a fit or convulsion (epilepsy)?) two received psychiatric discharges one a medical discharge one was convicted by court-martial and only one remained fully active throughout the first year of service.

It is possible in this sample of men on the basis of the item analysis to devise scoring systems that differentiate sharply between those active and those discharged for psychiatric disability. The validity of these scoring systems however must be tested on samples other than the one which revealed the significant items.

Age years of education and intelligence as measured by the Armed Forces Qualifications Test were not significantly related to the criteria of adequacy of military performance.

COMMENTS

The CMI elicits a man's medical self report. Regardless of anatomic disabilities there are those who complain excessively and those who do not. Men with few complaints on the CMI generally did better in military service than those with many complaints.

Poor morale sometimes leads to falsification in medical report. It is not known how common exaggeration on questionnaires or in oral interview would be if inductees knew that many medical complaints ensure rejection for service. During World War II, falsification by draftees on medical questionnaires was no more frequent than it was in oral interview. The dangers of falsification on a medical questionnaire can be reduced by combining its use with oral psychiatric interview.

Predictions of adequacy for military service are usually based on estimates of the man's personality structure, however, even if a man's personality structure could be evaluated precisely and in detail the psychologic qualities most and least desirable for each duty in military service never have been defined. In this study predictions were based on each man's reactions to the pressures of civilian life as manifested by the number of his medical and psychiatric complaints on the CMI.

The criteria of adequate military service are those important to the armed services. In this study of a Marine Corps sample they are the same as those used in a study of an Army sample.⁵

While there is a significant correlation between CMI scores and the criteria of adequacy of military behavior, the coefficient of correlation is not sufficiently high to permit identification of every person who will fail to function effectively. Indeed, using a cut off level of 46 "yes" responses on the CMI to identify five percent of the Marine Corps sample reported, 69 of the 79 men discharged for any reason during the first year of service were false negatives in that they had fewer than 46 "yes" responses and 29 of the 39 men with 46 or more "yes" responses were false positives in that they were not discharged. While these percentages of false negatives and false positives compare favorably with those of other methods of predicting adequacy for military service, the CMI scores can be used merely to classify inductees into groups for which an actuarial estimate of the probable number of men who will perform poorly can be made. As in actuarial practice, it is not possible to identify the men specifically.

A leading reason why the CMI or any other method of estimating adequacy for military service cannot give completely accurate predictions is that men in military service are not subjected to uniform amounts of stress. Stress in military service depends on such influences as unit morale, interpersonal relations among enlisted men and with commanding officers, station fatigue, and the intensity and duration of combat. Even if it were possible to predict that a man will perform inadequately under designated military stresses, there is no way of predicting the specific stresses to which a man will be subjected in service.

Situations inducing stress arise during the entire period of a man's enlistment. In the sample studied discharges also occurred over the entire span of the study.

The alternative to using imperfect techniques of identifying at the induction station men who would probably do poorly in service is to give each man the test of actual service. This test may be used to determine not only whether a man is suitable for service but also to some extent the type of duties for which he is most useful in the military service.

It is not possible with this sample to compare fully the use of the CMI alone with the psychiatric interview alone in predicting adequacy for service. Because they were not subjected to a test of service it is not known how many of the men with few complaints on the CMI might have performed adequate military duty but were rejected at induction by psychiatrists.

The CMI may be used to classify men as regards probable adequacy for military service. How profitable such a classification is and what disposition to make of men deemed inadequate are questions to which the answers must be dictated by military needs and the size of the available manpower reserve.

SUMMARY

The Cornell Medical Index Health Questionnaire was administered at preinduction examination to 783 unselected men subsequently drafted into the Marine Corps. Responses on the CMI were related to chosen criteria about adequacy of performance of military duties.

Present data indicate that men with many medical and psychiatric complaints generally fail to perform as well as men with fewer complaints and that the number of complaints men make on the CMI at preinduction examination is often predictive of the adequacy of their military performance.

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Roentgenographic Demonstration of Meckel's Diverticulum

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MECKEL'S diverticulum is a common congenital anomaly of the gastrointestinal tract and a rather frequent site of disease. Its demonstration by roentgenography is so unusual that Sloan and associates¹ could find only 22 instances in the literature to which they added two cases. Other recent reports²⁻⁴ increased this number to 29. It is thought worthwhile to add two recent cases seen at this hospital, only one of which was recognized preoperatively.

CASE REPORTS

Case 1 This 30 year old man became ill in 1944 with transient cramping pain in the right upper quadrant of the abdomen. It subsided spontaneously, recurred several times in the next eight months but not subsequently. The daily passage of red blood in the stool for one month necessitated a transfusion with six pints of blood in 1947. Melena did not recur but weakness and anemia necessitated hospitalization and transfusions in 1948, 1949, 1951 and January 1953. On each occasion the roentgenographic examination of the esophagus, stomach, small bowel, and colon was reported to be negative. Esophagoscopy, gastroscopy and proctoscopy failed to reveal a bleeding site. Occult blood was present in all stool specimens. Recurrent weakness was the cause of admission on 30 March 1953.

No abnormal findings were noted on physical examination. The significant laboratory studies were red blood cell count, 3,200,000 per cu mm; reticulocytes, 8.1 percent; hemoglobin, 5.8 grams per 100 cc; and hematocrit, 24 percent. There was occult blood in the stool. The barium enema roentgenographic examination revealed a dilated segment of small intestine about 25 centimeters long located 45 centimeters proximal to the ileocecal valve. This was thought to represent reduplication of the intestine or chronic small bowel obstruction secondary to a Meckel's diverticulum. Previous roentgenograms were reviewed.

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Figur 1 (e l) (A) Rar m em full a larg We k l d vertical m the ght l w quadr i f the bd m n Th pp ndix d t m nal l m i n (B) Aft cuat y m fib ba m rem n the d t culum (C) D gr mm tuc p f tio f o tg noy m (D)

and the Meckel's diverticulum identified on the studies made as far back as 1948 (fig 1)

After transfusions had been given, a laparotomy was performed. The cecum was normal. A very large Meckel's diverticulum was found protruding at a sharp angle from the distal ileum, and causing some obstruction. The bowel proximal to the diverticulum was thick walled and dilated to a diameter of six centimeters. The diverticulum and a segment of ileum was removed so that normal tissue could be used for reanastomosis. Histologic study of the specimen demonstrated chronic inflammation but no ulceration or aberrant tissue. The patient has remained well for one year without recurrence of the anemia or hemorrhage.

The diverticulum in this case was demonstrated by roentgenography to lie in the right lower quadrant of the abdomen, and was so large that its shadow was mistaken for that of the cecum. Although no ulcer was discovered in the specimen, the inflammatory reaction and obstruction produced by torsion leave little doubt that this was the site from which the bleeding occurred.

Case 2 This 30 year old man first became ill in 1952 with hematemesis and bloody diarrhea. He was hospitalized and given a transfusion of 3 000 cc of blood. The results of a roentgenographic examination were not available but the patient was placed on therapy usually employed for duodenal ulcer. Subsequent roentgenologic examination of the upper gastrointestinal tract was negative in October 1952. The reappearance of tarry stools, without symptoms prompted hospitalization at this hospital in February and December 1953. On each occasion bleeding stopped soon after admission, and thorough investigation of the gastrointestinal tract by roentgenographic and endoscopic examinations failed to reveal a lesion. On 26 February 1954 the stools again became tarry, there was some mild mid abdominal cramping distress and the patient entered the hospital. He appeared apprehensive but there was no evidence of shock. The blood pressure was 124/78 mm Hg pulse, 92 and the temperature, 99.0 F. The abdomen was soft the epigastrium was tender but there was no muscle spasm or guarding, no organs or masses were palpable. The red blood cell count was 4 100,000 per cu mm, hemoglobin, 10.0 grams per 100 cc and hematocrit 30 percent.

A 1 000 cc blood transfusion was given and he was placed on hourly feedings of a milk skimmed milk powder mixture. Bleeding continued at a slow rate. Roentgenograms made on the previous admission in December 1953 (fig 2) were reviewed and it was thought that a minor deformity of the duodenal bulb had been

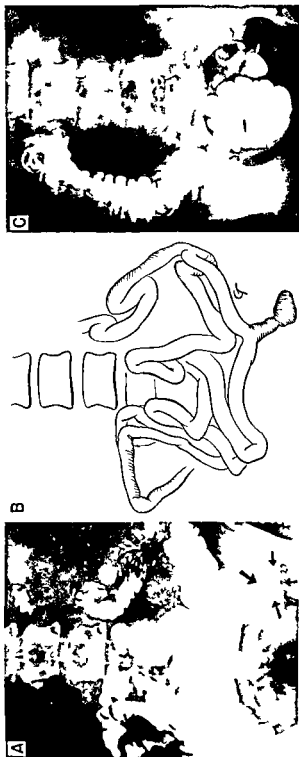


Figure 2 (A) Gross specimen of a large, lobulated, fleshy mass (B) Diagram of the mass showing its relationship to the vertebral column and surrounding structures (C) Microscopic view of the mass showing cellular details

present. After another transfusion, an exploratory laparotomy was performed. No bleeding site could be found in the stomach or duodenal bulb. About 120 centimeters from the ileocecal valve protruding at right angles from the terminal ileum was a Meckel's diverticulum, seven centimeters long and the diameter was the same as the ileum. Two centimeters from its tip was a deep circular constriction passing entirely around the diverticulum. The diverticulum was resected and when opened, a deep ulcer was seen at the site of the constriction. An additional finding was a small nodule of aberrant pancreatic tissue in the antrum of the stomach. Microscopic study of the diverticulum demonstrated a chronic well defined ulcer, with a moderate sized artery at its base. The mucosa was jejunal in type and no gastric or pancreatic tissue could be identified.

In this case resection of the stomach was planned preoperatively because of recurrent upper gastrointestinal hemorrhage and minor roentgenographic abnormalities of the duodenal bulb. The excellent roentgen ray demonstration of a Meckel's diverticulum with ulcer and constriction had been overlooked.

DISCUSSION

In the course of fetal development the vitelline duct (omphalomesenteric structure) disappears between the fifth and seventh week. In about two percent of persons the obliteration is incomplete, and a small portion of the duct persists as a diverticulum from the antimesenteric border of the ileum usually about 100 centimeters proximal to the ileocecal valve. The average length of the diverticulum is about five centimeters, it is usually lined with ileal mucosa but may contain gastric or pancreatic tissue as well. Diseases of clinical significance are infrequent but hemorrhage, obstruction, intussusception, inflammation, and tumor formation are all seen. A diagnosis can be made with assurance only at laparotomy.

Diagnosis by roentgenography is difficult for the diverticulum has a wide ostium and seldom retains the barium longer than do adjacent loops of small intestine. The diameter and mucosal pattern of the diverticulum is such that even when filled it is usually thought to represent a segment of the normal ileum. When inflamed there may be difficulty in filling but the disease processes alter the roentgenographic appearance so that an abnormality may be detected. Fluoroscopic observations have been made² and these permit much greater assurance in diagnosis. Small intestine roentgenographic studies offer the best opportunity for detecting this abnormality, but some will be seen with the barium enema as shown in figure 1. Gastrointestinal hemorrhage without a demonstrable lesion should prompt careful study for a Meckel's

diverticulum When a laparotomy is performed for bleeding the small intestine must be thoroughly explored to exclude the possibility of bleeding from a Meckel's diverticulum before resorting to blind subtotal gastrectomy

SUMMARY

Meckel's diverticulum is infrequently demonstrated by roentgenography of the gastrointestinal tract. Two cases in which such demonstration was made are reported. Although present on multiple studies the anomaly had been previously overlooked. In each patient massive gastrointestinal hemorrhage was present without other symptoms or signs the diverticulum was surgically removed in both. A chronic ulcer was present in the diverticulum of one patient.

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SAFETY ENGINEERING IN MOTOR VEHICLES

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—I. S. SMILLIE

B. tish. M. d. l. J. nal.
p. 205, J. ly. 24, 1954

Hypertrophy of the Condyle of the Mandible

PETER ZANCA *Colonel MC USA*
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HYPERTROPHY of the condyle of the mandible is rare. As of April 1951, only 41 cases had been reported in the literature.¹ This condition is mentioned in few textbooks and then only a scanty description is given. Gottlieb² has described this condition in some detail. The cause is unknown and the diagnosis is made from the clinical, radiographic, and pathologic findings.

Hypertrophy or hyperplasia of the condyle of the mandible is a benign disease process of obscure origin which produces a deformity and asymmetry of the mandible and results in functional disturbance. In most of the cases there is malocclusion, enlargement of the head of the condyle, and elongation of the ascending ramus of the mandible which lowers the angle of the jaw and shifts the symphysis menti toward the unaffected side. Deformity of the face is noted in the temporal region and over the zygoma.

The symptoms in this condition are variable. Some patients complain of pain in the temporomandibular region, others complain of crepitus or "locking" while still others have some difficulty in mastication. Some patients have no symptoms and report for medical care only because of the progressive facial deformity.

CASE REPORT

A 23 year old Negro soldier was admitted to the hospital on 21 November 1953 complaining of a dull pain in the right temporomandibular joint region and of "pain in the jaw," especially on chewing.

In May 1953 the patient had first noted that his face was asymmetrical and that his jaw was pushed to the left. In October he developed dull pain in the right temporomandibular region. On 12 November the jaw suddenly "locked" while he was eating and he was unable to open his mouth. He was then evacuated to an Army hospital where a tentative diagnosis of dislocation of the right temporomandibular articulation was made. His general health had always been good and he had had no chills, fever, or known dental sepsis.

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Physical examination at the time of admission to this hospital disclosed a marked asymmetry of the face with deviation of the mandible to the left. There was a firm nontender enlargement over the area of the condyle of the right mandible

Routine blood tests urinalysis and acid and alkaline phosphatase were within normal limits The serologic test for syphilis was negative



Fig 1 Right nontender enlargement of the condyle of the right mandible with deviation of the mandible to the left of the symphysis mentalis

Roentgenograms of the mandible taken 23 November showed elongation of the ascending ramus of the right mandible and marked enlargement and sclerosis of the condyle of the right mandible (fig 1). There was uniform calcification of the condyle but the articular surface was irregular (fig 2). No periosteal reaction was present. The mandible was deformed and asymmetrical with the symphysis menti shifted to the left side (fig 3).

A skeletal survey failed to reveal any evidence of bone abnormality involving the skull, pelvis, or upper or lower extremities.



Figure 2. The articular surface of the condyle is irregular and the condyle is sclerotic and thickened.

From the time of adolescence, the patient continued to have difficulty in opening his mouth. On 6 November, under general anesthesia, the right temporomandibular joint was explored, and the condyle of the right mandible was found to be enlarged to about five times its normal size. Its mass had a bony consistency and had the appearance of bone growth. This portion of the mandible was excised.

Cross Pathologic Examination. The tissue was very hard and sclerotic. The many small associated bony chips did not appear

unusual The greatest dimension of the condyle was three centimeters The superior cartilaginous surface appeared to be thrown into small folds but the surface was shiny There was no visible marrow cavity

Microscopic Examination The cartilage showed a low grade overgrowth and its surface was folded Its growth however was orderly Little variation was seen throughout the full width of the bony structure There was a diffuse thickening of the bony trabeculae so that these were separated only by narrow marrow spaces that were largely occupied by dense and lacy fibrous tissue containing a few fat cells and only small foci of blood cells and plasma cells Surmounting the surface of the irregularly shaped bony trabeculae were orderly single rows of osteoblasts Within the thick trabeculae were numerous well aligned prominent cement lines these however were not so prominent as those seen in Paget's disease (fig 4)



Fig 3 The model is formed and symmetrical.



Figur 4. The section shows slight hypertrophy of the cartilage of the articular surface of the condyle and diffuse thickening of the underlying bony trabeculae

Postoperatively the patient did well and the wound healed uneventfully. There was a slight residual deviation of the jaw to the left; however, the patient had complete relief of pain, and was now able to open his mouth widely.

DISCUSSION AND CONCLUSIONS

Enlargement of the head of the mandibular condyle is seen in inflammatory disease (Paget's disease), fibrous dysplasia, granuloma, and such bone tumors as osteoma, osteoid osteoma, chondroma, ossifying fibroma, osteochondroma, giant-cell tumor, and osteogenic sarcoma. In all these conditions the clinical course, signs and symptoms, and roentgenographic features may simulate a true hyperplasia of the mandibular condyle. The final diagnosis can only be made by histologic study of a biopsy specimen.

Early surgical treatment consisting of osteotomy or ostectomy will correct the facial deformity and malocclusion, will improve mastication, and will produce a satisfactory cosmetic result with complete relief of pain.

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Neuroblastoma

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WILLIAM H WINCHELL *F t L ut t MC USAR*

IN MEDICAL literature there are many reports of a tumor arising from immature undifferentiated neuroblasts and known as neuroblastoma. These reports list its most common primary site as the medulla of the adrenal and its occurrence to be preponderantly in newborns, infants and small children. These facts are commonly known but still there is confusion as to classification and terminology. The lesions have been called sympathogoniomas, sympathicoblastomas, gangliosympathicoblastomas and sympathoma embryonale. No attempt will be made in this report to clarify this situation but it would be well to keep in mind that Willis considered this tumor to be closely related to the ganglioneuroma which is distinguished by well differentiated nerve cells and fibers.

The neuroblastoma, being the most primitive, is the more rapid growing and malignant. Transitional and mixed types occur and occasionally show tendencies to differentiate into chromaffin cells as well as nerve cells.

As a primary tumor they are rarely seen in the central nervous system and Shenkin stated that those so far described as intracranial neuroblastomas may well be classified as either a form of the medulloblastoma or glioblastoma. Willis confirmed these opinions and also noted that cerebral metastases had not been reported.

In the past the metastatic pattern from this tumor has been classified into two types: the Pepper and the Hutchinson. The Pepper type is said to be from neuroblastomas of the right adrenal which invade the local lymphatics and extend to the liver, pleura and lungs. The Hutchinson type originates as a tumor of the left adrenal and is said to spread to the regional lymph nodes from where it passes down along the iliacs to the pelvis, then to the mesenteric nodes and the liver. It then enters the portal spaces from where it passes along the posterior mediastinum and the intercostal lymphatics to the deep cervical chain where it finally comes to rest in the bones of the skull.

Neuroblastoma was originally thought to metastasize via the lymphatics exclusively and the above classification bears this

The child was placed on supportive therapy in the form of penicillin streptomycin whole blood transfusions and from 100 mg to 200 mg of cortisone daily. Little or no improvement of his status was noted.

Progressive enlargement of the liver and increase in the ecchymoses about the eyes raised a suspicion that the case was not typical of leukemia and this was further substantiated by a progressive widening of all the cranial sutures. Nineteen days after admission roentgenograms of the skull were reported to be negative. Whereas those made on the twenty-ninth hospital day showed definite widening of the sutures. On the forty-fourth hospital day skeletal surveys showed extensive metastatic malignancy involving both femurs, tibiae, and fibulae. All areas of destruction were quite small and there were erosions of the orbital walls. Increased areas of density were present in the skull bones.

During the course of the illness the erythrocyte count progressively decreased to about 1.5 million per cu mm with a hemoglobin average of 3.9 grams per 100 cc. The leukocyte count after the initial leukopenia varied from 6,000 to 10,000 per cu mm with the neutrophil-lymphocyte ratio remaining about the same, the lymphocytes ranging from 72 to 84 percent.

Because of the combination of swelling and ecchymoses about the eyes with increase in the head size and the absence of true leukemic changes in the peripheral blood it was believed early in the course of the disease that a neuroblastoma was the probable culprit. True to form the primary mass in the region of the adrenal gland was not felt until late in the course of the disease. On the fifty-fourth hospital day, three days prior to death, it was felt in the left upper quadrant as a small irregular kidney-shaped mass.

Autopsy Findings. The head was enlarged having a fronto-occipital circumference of 21.5 inches (average normal 19.4 inches). The orbital soft tissue protruded especially above the eyes and the right eye showed a medial strabismus. The liver extended seven centimeters below the right costal margin, nine centimeters below the xiphoid, and three centimeters below the lateral costal margin. On the anterior surface of the liver and in the parenchyma were numerous white nodular areas measuring from 0.5 mm to 2 mm in diameter. The primary mass was a roughly spherical tumor occupying the site of the left adrenal gland. It measured 7 by 6 by 5 cm and was partially covered by a thin transparent capsule. Cut sections revealed the mass to be formed of a red, friable and somewhat translucent tissue in which were seen multiple soft, yellowish punctate areas. Septumlike structures were seen to extend from the capsule into

the tumor mass dividing into irregular lobes. Large necrotic and hemorrhagic areas were present. Attached centrally to this tumor were several large dark-brown matted lymph nodes. The right adrenal gland grossly appeared normal. The same type of

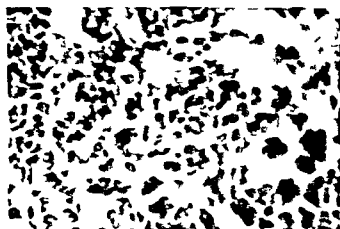


Figure 1 Photomicrograph of neuroblastoma taken from the primary site. Note rosettes ($\times 300$)

tumor tissue was seen replacing the head of the pancreas and many of the para-aortic lymph nodes. In the head, tumor tissue was identified in temporalis muscles and on the inner surfaces



Figure 2. Clothed up with metastatic tumor tissue within and about blood vessels ($\times 30$). Figure 3. High magnification of rosettes showing glandular formation ($\times 80$)

of the cranial bones. All tumor tissue identified was extracranial and that in the orbits involved the soft tissues and in part replaced the extraocular muscles. The brain showed no remarkable

changes except a possible slight increase in size of the lateral ventricles and of the choroid plexus of the left ventricle

Microscopic Examination The tumor mass from the upper pole of the left kidney showed a large amount of necrosis with a few areas of calcium deposition Where viable the cells were small and the nucleus of each appeared to occupy the major portion of the cell There was a moderate amount of nuclear variability as to size and many were hyperchromatic These cells were arranged in sheets and many rosette formations could be seen (fig 1) The cytoplasm of any given cell was not delimited and mitotic activity was infrequent No fibrillar formations were present in the central portions of the rosettes the cytoplasm appearing as a homogeneous mass Metastatic tumor was seen in the regional lymph nodes in the liver in the pancreas in the soft tissues of the orbits in the temporalis muscles and extraocular muscles and in the skull bones long bones and sternum In these sites the cells of the tumor were identical to those seen in the primary tumor They were in the form of sheets and the absence of rosette formation was noticeable A metastatic lesion worthy of special mention occurred in the choroid plexus of the left ventricle (figs 2 and 3) The tumor cells were infiltrated about one of the larger blood vessels were identical with those of the primary lesion and the metastatic lesions and showed some tendency to form rosettes Clumps of tumor cells were visible in the lumina of several of the neighboring smaller vessels

DISCUSSION

This type of tumor probably exists from the embryonic stage regardless of the age at which it becomes evident Another case of a neuroblastoma was recently seen at this hospital in an infant who died from a congenital pulmonic stenosis a few hours after birth The tumor was an incidental finding and was located in the right adrenal gland It was confined to the provisional or fetal zone and had not invaded the adult or true cortex

This case report confirms the assumption that neuroblastomas metastasize by way of blood vessels as well as by lymphatics Particularly interesting is the occurrence of a true intracranial metastatic lesion in the choroid plexus a finding which text books do not mention

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THE SURGEON THE PHYSICIAN AND THE SPECIALIST

The personality traits and aptitudes that go to making the good physician differ from those that are needed in the make up of the good surgeon. The surgeon performs in the limelight. He is the virtuoso of medicine. His professional work consists to a considerable extent in dealing with crises. At least to the patient the surgical operation is a crisis. The surgeon who enters and often leaves the patient's life at this time of crisis in a sense is always on the spot. He must make vital decisions with great rapidity. He must know his way around inside the human body with utter accuracy, certainty and confidence. He must be a robust, resilient, psychologically extroverted sort of person. If he did not have such qualities he could not take what the surgeon has to take.

The function of the physician is quite different. He is less concerned at least if he is of the category that I have called generalist with crises than with the sustained care of patients, keeping them well if he can, or trying to restore them to health if they become sick. He applies any sort of treatment that he is qualified to give and calls in specialists when skills beyond his competence are indicated. The qualities required to make a good physician are understanding, insight, purposeful sympathy, responsibility and patience. Also his personality must be one to inspire confidence. He is not on the spot as the surgeon is, and can more readily admit error without losing either face or patient, provided the patient has trust in him. His concern is with the whole patient. He is indeed the personal physician.

The specialist occupies an intermediate position between the physician and the surgeon in the sense in which I have used these terms. Often he retains charge of patients for long periods, but he is only taking care of a part of them. The difference, as I see it, between the three categories of practitioners of medicine that I have mentioned is that the surgeon is interested primarily in the operation and the specialist in the disease, but the nonspecialized physician or generalist is interested primarily in the person.

—JAMES HOWARD MEANS, M.D.
in *New England Journal of Medicine*
p 767 May 6 1954

A Severe Case of Hyperemesis Gravidarum

JOSEPH E LIFSCHUTZ *Capt n MC USA*

HOWARD HORNER *C pt MC USA*

NAUSEA and vomiting which occur in many pregnancies may be said to become pernicious when they "interfere seriously with nutrition." We have recently had under our care a patient with severe intractable persistent vomiting complicated by serious physiologic and psychologic difficulties who delivered a normal full term infant. There are several instructive aspects to the case which merit discussion.

CASE REPORT

The patient was a 38 year old housewife dependent of an Air Force serviceman first seen on the psychiatric service of this hospital on 11 November 1953 where she had been transferred from an Air Force Station hospital. She was first seen at the referring hospital three weeks earlier because her menstrual period was a few days late. It was then determined that she was probably pregnant. Five days later she returned because of persistent nausea which had just begun and she was started on 50 mg of dimenhydrinate (dramamine) every six hours. She returned to the station hospital however six days before her admission to this hospital because of persistent vomiting, insomnia and because she was becoming emotionally upset. Finally because she was depressed and disturbed and had episodes of loud crying she was admitted to the station hospital.

Just prior to her transfer here the patient was seen by a physician who had known her during a previous pregnancy in Germany in 1949. At that time she had had hyperemesis gravidarum which was later complicated by severe psychoneurotic depression and dissociative reaction. That pregnancy was terminated by therapeutic abortion for these reasons.

The patient was oriented as to time and place and her memory was excellent except when temporarily impaired by sedation. She exhibited outbreaks of uncontrollable emotion but even then showed a vestige of volitional control. There were no delusions or hallucinations. She was depressed, expressed ideas of guilt.

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and was ambivalent in worrying about her feelings. Her depression was associated with aggression and hostility, which was weakly expressed against herself but strongly against her environment and personnel on the ward. Her physical condition was described as fair. A trial of intensive psychiatric care and sedation was recommended. The next day, the patient became more disturbed and in her excitement slipped an arm loose from the restraint. She broke a glass and scratched her wrists a little more than superficially although not requiring sutures. It was noted that as soon as she had scratched herself she made so much noise that personnel on the ward soon arrived on the scene. She was then given amobarbital (amytal) intravenously. During a 48 hour period at that hospital she was given scopolamine, chloral hydrate, amobarbital sodium and phenobarbital sodium intramuscularly, paraldehyde rectally, and fluids intravenously.

The patient was beginning her fifth pregnancy, having been married in 1939 and first becoming pregnant in 1940. This pregnancy terminated with a spontaneous miscarriage after three months. The second pregnancy was carried through successfully and the patient has an 11 year old boy, her only child. The third and fourth pregnancies both terminated in therapeutic abortions for severe hyperemesis gravidarum. Symptoms of hyperemesis were also present in the first two pregnancies, and it is interesting to note that at the time of admission to this hospital she stated that the reason she carried her second pregnancy to term was because of her complete confidence in her physician, who apparently was a general practitioner and who, she said, sat by her bedside and reassured her during her spells of hyperemesis.

She had made superficial suicidal attempts during her past pregnancies similar to the one described above. Apparently, between pregnancies, she was well with no mental or emotional symptoms.

The patient had attended junior college one year and had worked as an attendant in a home for the feeble-minded before getting married. She had known her husband for one year before their marriage. She described him as likeable, fair and easy going. She remarked, "My husband and I like things to be smooth." By this she meant that they could not discuss any differences they might have between them. She also stated that in sexual relationships she was more aggressive than her husband; this was especially true at the beginning of their marriage. As a small girl the patient was very close to her father and could talk to him better than she could to her mother.

Her mental examination on admission showed a tall thin gray haired woman looking older than her age, vomiting and in acute distress. She cried easily and seemed to be angry with herself for vomiting but she said I'm afraid to vomit and yet I'm afraid not to vomit. She appeared to be forcing herself to vomit and seemed to be unable to decide whether or not vomiting proved the more uncomfortable. Her general knowledge was good and she seemed intelligent. There were definitely no evidences of delusions or hallucinations or of any other psychotic trends. The physical examination and laboratory tests were essentially negative.

From the day of admission therapy was administered by the psychiatric service in conjunction with the obstetric service. Fluids administered intravenously, sedatives, vitamins, a darkened room and psychotherapy were recommended. It soon became apparent that she was doing everything she could to upset the staff of the psychiatric service to the extent that her pregnancy would be terminated as were her previous ones. Therefore the first step was to make the patient understand that she was not going to have a therapeutic abortion certainly not until a long and intensive course of treatment which we believed was indicated had been given.

She vomited excessively for the first few days in the hospital. It was necessary to use amobarbital intravenously and intramuscularly in considerable amounts in addition wet-sheet packs were used. Meanwhile the therapist saw the patient daily and assured her that she would get better although making it clear that he would not recommend that the pregnancy be terminated even though she might seem to be getting worse temporarily. Essentially this attitude was maintained throughout the patient's hospitalization during her remissions and exacerbations.

During the patient's hospitalization her main medications were vitamins 50 mg of pyridoxine hydrochloride daily and dimenhydrinate in various doses the largest one being 100 mg four times daily first by injection and then orally.

The patient gradually accepted the therapist. An interesting psychologic sidelight was noted at this point. We were impressed with the patient's attachment perhaps over attachment to her father in her formative years although no considerable data was obtained. After the birth of a boy after her second pregnancy the patient heard her father tell her husband, Don't you ever get that girl pregnant again. It seems likely that the patient may have been unconsciously following her father's advice.

Therefore she vomited, attempting to have the pregnancy terminated, and in that way obeyed her father. The goal in therapy then was for the therapist, in some way, to become the father figure for the patient so that she could identify him with her father as someone who could control the situation. The therapist did this by making conscious attempts to be fatherly and reassuring to the patient. The therapist explicitly told the patient in this fatherly capacity, "It is all right for you to have this baby," in other words, contradicting what her real father had said.

She was admitted three times to this hospital. After the first week of hospitalization beginning on 11 November 1953 the patient gradually stopped vomiting and by December the episodes of vomiting were rare. She was discharged on 16 January 1954 on routine medications (pyridoxine hydrochloride, other vitamins, and dimenhydrinate, all orally) and a full diet. Three weeks later she began vomiting again after a slight change in her medication regimen. She was readmitted for the second time on 7 February 1954 and discharged on 18 February after routine medications were reinstituted and after a period free from vomiting.

A month later her medications were again changed slightly because of rapid weight gain and slightly elevated blood pressure. She again started vomiting and her third and final admission began on 24 March 1954. On 26 March 1954 she complained of substernal pain and an electrocardiogram revealed probable acute coronary insufficiency. She was then closely followed by the medical service, and given opiates when necessary.

Between 24 March and 7 June she was a closed ward psychiatric patient, for purposes of management. During this time she remained in an unstable state in which she was unable to control her excessive vomiting. This soon occurred just once a day, in midafternoon, despite continued administration of dimenhydrinate and vitamins. She would eat a light breakfast and lunch, become nauseated between two and four p.m., regurgitate small amounts and scream and wail continuously. After she became tolerant to excessive doses of amobarbital, and when she had had a number of intramuscular injections of paraldehyde she was started on small single doses of morphine or codeine daily. These would quiet her so that she usually slept during the night.

After a review of her case it was felt that she should be sterilized at the end of the pregnancy because of her coronary insufficiency, and because of her emotional difficulties. It was felt that this would be difficult to accomplish at this time.

active labor as well as be exposed to the danger of an intra partum psychosis. Consequently on 7 June in the thirty eighth week of pregnancy a low flap cesarean section and bilateral tubal ligation was performed. A normal healthy seven pound infant girl was delivered and the patient's recovery was uneventful. Nausea and vomiting ceased with the delivery and have not recurred. The patient's emotional state returned to its "nongravid" condition. She was performing her duties adequately as a mother one month after delivery.

COMMENT

It appears that the psychic defenses of this patient were hysteric repressive in nature. In retrospect we can only guess that her course would have been more benign if her changes in medication had been accomplished more judiciously, perhaps if she had been in the hospital when they became necessary. One might wonder what would have happened if a similar consistent and unwavering attitude shown by the responsible physicians in this pregnancy had been maintained in her third and fourth pregnancies when her almost consciously expressed desires not to have children were acceded to and therapeutic abortions were performed.

In a series of 20 cases of pernicious vomiting, recently reported by Harvey and Sherfey, several *psychologic factors* were consistently found. One was the general psychological immaturity which all these women presented. None of the patients had achieved a reasonably adequate self dependence. *

These patients without exception exhibited a self centered concern with underlying need for a dependent role which came to the fore with the stress of pregnancy. This dependency need was particularly prominent in our patient especially during pregnancy.

SUMMARY

Our patient was an immature hysteric pregnant woman with frequent periods of severe vomiting who late in pregnancy developed clinical signs of acute coronary insufficiency. She had a history of two prior therapeutic abortions for hyperemesis and one prior spontaneous miscarriage. Through the combined efforts of the psychiatric, obstetric and medical services of the hospital she was carried to term and delivered of a normal healthy infant. She corresponded in her immaturity and dependency needs with other patients with hyperemesis reported in the literature and knowledge of these factors was used in therapy.

REFERENCE

1. Harvey W. A. and Sherfey M. J. *Vomiting in pregnancy*. *Psychosomatic Medicine*, 16: 19, July 1954.

OFFICIAL DECORATIONS

LEGION OF MERIT

Dan Cr 21 Lt Col MC, USA	James P Papp Col. MC, USA
J hn F K ll 88 Jr Lt Col MC, USA	J mes T Richards Lt Col MSC, USA
Spurg o H. N l j Lt Col MC USA	William T Williams Col DC, USA

SOLDIER S MEDAL

P te k l m n l t Lt MC, USA

BRONZE STAR MEDAL

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Jo ph B n tt Capt MC, USA	William H Mor May MC, USA
R bet T B l 1st Lt MSC USA	F n ss C N ls n, Lt Col MSC USA
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Purld G umsl y l t Lt. DC, USA	R bert C. Sp ull Capt. DC, USA
R h rd M Hall Capt. DC USA	B oc Stafford 1st Lt. MSC, USA
R bert S H gd n Col. MC USA	John O T llman, May MSC, USA
P ul E K ll Col MC USA	Elbr dg W Telford Lt Col MC USA
W lte L Lumpkin Lt Col & C USA	J hn P v l eause May MSC USA
J ph F Lyd n, 1st Lt MC, USA	Sam l G W ts Capt MC, USA
J me E Ma Capt MSC, USA	Erwin Z mo Capt. MSC, USA

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D x D f nd fer Capt. ANC, USA	Do thy M Th l Capt. ANC, USA
R bert G F reg ald Jr Capt MC USA	Arnold E Tynd ll Capt. MSC, USA
R h d S F x t Col USAF (MC)	Thomas V s Capt. MSC, USA
H ber Gill Capt. MC USA	Harry W ner 1st Lt. MC USA
Stanf d M Golda n 2d Lt. MSC, USA	Richard M. Wt y Capt. DC, USA

Award d po thumously

Oak L f Cl ter

Th nam f off s f th med l s rvc who ha e be n aw d d dec rat o s by
h Un d Stat s Army Navy & Air F c are published in this departm at each month
fol wing t apt f inf rm tion fr m off sal our s —Editor

MAJOR ROBINSON CHOSEN PRESIDENT ELECT OF AMERICAN OCCUPATIONAL THERAPY ASSN

Major Ruth A. Robinson WMSC, USA, chief occupational therapist of Fitzsimons Army Hospital, Denver, Colo., was chosen president elect of the American Occupational Therapy Association at its thirty-seventh annual conference in Washington, D. C., 16-22 October 1954. Captain Gertrude Murray WMSC, USA, Fort Benning, Ga., and Captain Wilma L. West WMSC, USA, Valley Forge Army Hospital, Phoenixville, Pa., were elected members of the board of management of the Association.



Miss Herta M. Nery, left, presided at the American Occupational Therapy Association, and Major Ruth A. Robinson, WMSC, USA, president elect.

Officers of the military medical service who participated in the scientific program included Captain Bernadine G. Choren WMSC, USA; Major Donald A. Davis WMSC, USA; Captain Elizabeth M. Nachod WMSC, USA; and Lieutenant Colonel Helen R. Sheehan WMSC, USA, Walter Reed Army Hospital, Washington, D. C., and Captain John A. Eyring Jr., WMSC, USA, Office of the Surgeon General, Department of the Army.

Prior to her present assignment, Major Robinson was chief of the occupational therapy section of the Women's Medical Specialist Corps and chief of the occupational therapy branch in the Office of the Army Surgeon General. She is a graduate of the Boston School of Occupational Therapy and has been on active duty since 1944. At the Washington meeting, she was the chairman of the sectional meeting on tuberculosis.

REGULAR MEDICAL CORPS OFFICERS CERTIFIED BY SPECIALTY BOARDS

The American Board of Preventive Medicine

Organized in 1948, the American Board of Preventive Medicine is one of the youngest but fastest growing of the specialty boards. By 30 June 1953 it had certified a total of 1,068 physicians and was twelfth in size among the 18 approved boards. Originally incorporated as the American Board of Preventive Medicine and Public Health, the name was changed in 1953 when approval was granted to certify qualified physicians in aviation medicine as well as in public health. At present the following 142 members of the Medical Corps of the Regular Army, Navy, and Air Force hold certificates from this board:

Public Health and Aviation Medicine

Theodore C. B. Dwyll, Jr. Col USAF
Otis O. Beatty, Jr. Brig Gen. USAF
F. L. Duff Col USAF
H. V. Ellinger Lt. Col USAF

William J. Kennedy Brig Gen. USAF
L. C. Kossuth Lt. Col USAF
Chas. H. Mohr Col USAF
William F. Patterson Col USAF

Public Health

Robert W. Babb Capt USN
Philip R. Berkley Lt. Col USA
Abraham S. Benson Lt. Col USA
Ott L. Burt Capt USN
Robert L. Cullen Col USA
G. R. Caproni Col USA
Thomas J. Catlett Capt USN
Stewart S. Cook Rear Adm. USN
F. E. Cunniff Lt. Col USA

Walter R. DeFries Lt. Col USA
Edward J. Doherty Lt. Col USA
Albion R. Dobson Col USA
Thomas B. Dunham Capt USA

Clifford M. Eberhart Lt. Col USA

Thomas G. Felt Col USA
Richard H. Fletcher Capt USN

Robert C. Gaikill Col USA
James H. Goddard Col USA

John F. Harter Lt. Col USA
B. D. Hilland Col USA

Clifford P. Jeffers Comdr USN

Paul A. Kennedy Col USA

Harold L. Ley Jr. Maj USA
Douglas L. Dwyer Lt. Col USA
A. H. P. Long Col USA
Dorothy G. Hallow Brig Gen. USA
William F. Lyon Comdr USN

Irving H. Marshall Lt. Col USA

Richard P. Mason Col USA

James T. McGibony Col USA

Joseph H. M. Nach Col USA

Charles H. Mooney Col USA

Donald S. Myers Lt. Col USA

Guthrie L. Orth Col USA

Thomas E. Patton, Jr. Col USA

Robert S. Powers Capt USN

LeMont Pugh Rear Adm. USN

Adam J. Rappaport Col USA

John R. Rolfe Lt. Col USAF

Thirtieth day of Beginning next month, the *Journal* will take the name of
the *Journal of the Dental Corps of the Regular Army, Navy, and Air Force*.
Editorial and business correspondence should be sent to the *Journal of the Dental Corps of the Regular Army, Navy, and Air Force*.
—Editor

Public Health—Continued

J m J Sap	Capt. USN	Luc us G Th m	Col USA
A d w F S h l	Col USA	V C T p	Capt USN
R be V Sch l	Capt USN	H y G T u s g	Lt Col USAF
H rw A. S bul	Col USAF	O Ell tr U in C l	USA
H w d K S	Capt USN	L P V g l	Col USAF
I g ll H S mm	Lt C l USA	T m F Wh y	Col USA
Byr L S g	Col USA	William L W l	Brig Gen. USA
Cl ff d A Sw	R or Adm. USN		

Aviation Medicine

H nry G Arm tr g	May Gen. USAF	W lb E K llum	Capt USN
J ph A Ba d	Col USAF	Edwa d J K dr k	B g. Gen. USAF
Norma L B	Comdr USN	J h H K b	Capt USN
R b rt j B f d	Col USAF	William H L wton,	Col USAF
R b H Bl un	Col USAF	J m E L	Lt C l USAF
The D B	Capt USN	A thur W L y	Capt USN
J k B ll ud	Col USAF	V H Ma hb nk J	Lt C l USAF
S d y I B dy	Comdr USN	E l Ma w ll	Br g Gen. USAF
Clyd L B th	Brig Gen. USAF	L te E M Donald	Capt USN
Sheld S B w to	Col USAF	Ol F M Ilcay	Brig Gen. USAF
V A By	Col USAF	E l E M call	Capt USN
P ul A C mpb ll	Col USAF	L gd C N wma	Capt USN
W l A Ca l	Col USAF	Ol K N	Br g G n. USAF
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O W Ch naul	Capt USN	Edga L Ol o	Col USAF
R lph L Chr y J	Comdr USN	Cl ff d P Pho b	Capt USN
William F Co k	Col USAF	Ph l p B Phul p	Comdr USN
J hn R C p ha	C l USAF	K na th E pl h	Col USAF
Th ma H Cr uch	Col USAF	J eph P Pl l	Comdr USN
W tr d P D na	R or Adm. USN	William H P w ll J	Mat G n. USAF
C l T Do dua	Comdr USN	Alb rt H Schw h	be g Brig Gen. USA
V nc M D w y	Lt Col USAF	K h S S tr	Comdr USN
Jul C Ealy	Capt USN	H bert G Shepl	Capt USN
Th m F rw da	Capt USN	H ld A Smed l	Comdr USN
Do D Fl ka g	Brig Gen. USAF	All D Sm h,	Col USAF
F d k J F	J Col USAF	F is K Sm h,	Capt USN
D d C G d	Capt USN	J h T Smah	Capt USN
J y F G m l	Col USAF	B j min A S chl	J Col USAF
P ry W G d	Comdr USN	J h M T lbo	Col USAF
Ch l F G ll	Capt USN	Al az A T w	J C l USAF
M ll H G odw	Capt USN	Edw d J T y	B g Gen. USAF
A h G yb l	Cap USN	R ld H Tw h ll	Dr g Gen. USAF
G g B G n,	Col USAF	F nk B V	Comdr USN
L yd E Gr ff	Brig Gen. USAF	Rapha l L. W ur	Capt USN
W lf d F Hall	Brig Gen. USAF	M S Wh	Br g Gen. USAF
J M H gr	M j Gen. USAF	S muel J W l	Capt USN
J am L Holla d	Capt USN	J G W gh	Capt USN
A br y L J	ing Col USAF	Edw d M. Wurz l	Comdr USN
Mar hall N J	Col USAF		
W l L J	Comd USN		

A MESSAGE FROM THE A M A

Because of wide-spread interest in the results of previous surveys of physicians released from active military service, the Council on National Defense of the American Medical Association is presenting, in this and the January issue of the *Journal*, a brief summary of its most recent survey, covering the six months period ending 30 June 1954. The Council initiated this survey as a continuing project on 1 July 1952. Previous tabulations from the first year's survey were reported in the July and August 1954 issues of this *Journal*.

The questionnaire designed for this project was recently revised to include several new areas of activity not previously covered under the old form.

During the period from 1 January 1954 to 30 June 1954 a total of 1,948 questionnaires were distributed. Of these, 1,600 completed forms were returned to the Council. Although this 82 percent response is gratifying, the future success and value of the survey depends on the co-operation of those physicians so solicited. The Council therefore takes this opportunity to urge all physicians, when requested to complete the questionnaire, to give the matter prompt and responsive attention.

While additional information is available from the questionnaire, the following summation has been limited to the type of information most likely to be of general interest to physicians in the military service.

Age distribution by service. Of 1,600 physicians replying, 995 were between the ages of 30 and 35 years, 341 were between 25 and 30, 211 between 35 and 40, and 53 over 40 years of age. The largest number of physicians—698—were in the Army, 456 and 445 were in the Air Force and Navy, respectively. Likewise, the Army had the largest number in the 30-to-35 and the 40 and over age groups. Of those in the 25 to-30 age group, 126 were in the Navy and 123 in the Army.

Date of graduation from medical school. The great majority of reporting doctors (1,082, or over 67 percent) graduated from medical school between 1945 and 1950. Two hundred and fifty-seven graduated since 1950, and 234 between 1940 and 1945. Twenty-two reported graduation before 1940, and five failed to specify the date.

From the Council on National Defense of the American Medical Association. The
would pinions presented in the summary of the Department of Defense
—Editor

Sa db g A A E k N K N l D H L (MC) USN P lm J G C rw gh
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Reviews of Recent Books

AN ATLAS OF CONGENITAL ANOMALIES OF THE HEART AND GREAT VESSELS by Jesse E Edwards M D Thomas J Dry M A M B Ch B M S in Medicine F A C P Robert L Parker M D M S in Medicine F A C P Howard B B Chell M D Ph D in Medicine Earl H Wood M D Ph D in Physiology and Arthur H Bulbul M S D D S F A C D 2d edition 216 pages 491 illustrations (32 in full color) Charles C Thomas Publisher Springfield Ill 1954 Price \$13 50

The literature on cardiac anomalies has been notably enriched by the combined efforts of the six well known authors from the Mayo Clinic and Mayo Foundation who produced this atlas. All of the basic material presented in 1948 in *Congenital Anomalies of the Heart and Great Vessels* is included but so much has been added that the resulting atlas is far more than a new edition.

Case presentation is still the basic plan while in each of the sections the complications that may result from the conditions described are dealt with in greater detail and possible variations in cardiac or vascular structure are discussed. For numerous conditions there are included the results of the study of patients by oximetry, cardiac catheterization, determination of intra arterial pressure and dye dilution techniques. In addition a considerable number of malformations that were not included in the original version are described. Finally the expanded bibliography arranged under each subject alphabetically according to year provides more adequate coverage of the literature.

Both the internist and the surgeon will find this atlas most helpful in understanding and diagnosing cardiovascular malformations.

—BENNETT F AVERY Capt (MC) USN

ULTRASONIC AND ULTRASHORT WAVES IN MEDICINE by Johanna M V n W nt M D 384 page illustrated Elsevier Publishing Co New York N Y 1954 P e \$9

This book describes in detail several of the physiotherapeutic agents and their clinical effect on patients in the light of the author's stated concept of disease (a lack of resistance of the patient's body) and her attempt to correct this condition by administering stimuli which influence body cells. It reviews a relatively new physical agent, ultrasonic energy, and brings up to date older concepts regarding a portion of the electromagnetic spectrum including conventional diathermy and ultrashort wave applications and microwaves. Also included are her concepts in the field of hyperthermia and irradiation of the hypophysis with ultrashort wave energy.

THE UNCOMMON HEART DISEASES by *N t h a l E R b M D* 528
 pag 601 Il rat Ch l C Th ma P bl h Sp gf ld
 Ill 1954 P \$10 50

In th s discu sio f uncommon types f hea t dise e chapters are devot d to no structural c rdi vascular abno malit es traum t mor collag n d se se nonspec f c myoc rditis pe ic dit s syph l s tuberc lo i mycot c infections parasitic infestatio cor p lmon le nut t onal disturba es vitamin def ciencie met bolic di ord rs blood dy cra as neuromu cular disorders ffect f drugs electrolyte and tox ns and other m sc llan ous di eases of th myocardum peric rdi m and great vein

The autho h s be n too inclusi M y d eas su h as m la a a d Addison s d e should not h ve been included in a text on heart diseases Bec use of the bre dth of co g mo t di cuss n e sketchy a d of qu t on bl value The purpose f th bo k would ha e been bett r fulfilled f the ubj ct m tter had been limited nd the di cus ns more det iled The treatment presented of c diov scula syph l s s obsolete Several co d tions are illustrated by lect o-card ograms which co tal i g only a few le d show ng m nor ST d T cha g a not convinci g evidenc of myocardi l nvolveme t The incl ion f m tral stenosi a a cause of cor pulmo ale is op to que tion

The book is well p int d w th good illustr tion and h s a g d index nd deq ate b bl o raphic references It is not recomm nded because of the d ficie ci s m ntion d above

—EDWIN M. GOYETTE Col MC USA

ARTHRITIS AND RHEUMATISM by *Ch l L R y St b g M D* 326
 pag ll ra d Sp g P bl h g C I N w Y k N Y
 1954 P \$10

The fund ment l of phys i l gy f th joints and th pathol gy f he mato d a th t and collagen d seases are well decribed in the op n ng chapters of th s book Other chapter discuss the pr ctic l clinical pect of these di e se Th e a sep rate cha t rs o rheumat c fever rheumat d arthrit s rheum toid spondyl tis v r ts of heum toid rthritis syndrome and ommon joint di ord r psychogen c rheumat sm nd f brosis o teo thr ti g ut and g uty arthriti a d the m ligna t c ll gen di ease Each di ase is dis cus d f om the standp t of eti l gy pathology di gnosis treat ment d p g o i In addition there are hapt rs describ ng the phys cal examinaton and laborato y procedure p rformed on pati ts with the e d as and the orthopedic a d phy i al m dicin tr t m nt and rehabilit ti n f p t ents with the va ous types f thriti

The book s well org nzed and llust ated and s wrtten in a cl a concise style It i th o ghly up t d te a d should b valuable to physici s who re resp ns bl fo th ca of p t nt with rthritis nd the rheum tic d se es —GEORGE M. POWELL C I MC USA

GERIATRIC MEDICINE edit d by *Edward J Steglitz* M D 3d edition
718 pages 205 figures J B Lippincott Co Philadelphia Pa 1954

This volume extensively revised by deletions and additions consists of eight sections containing 42 chapters by 48 eminent contributors. Because geriatric medicine which concerns not only the care of the aging and the aged but also the prevention of premature senescence involves all facets of medical practice is not in itself a specialty but is common to all. In a concise authoritative and easy readable style this book presents the knowledge needed by those who share in the treatment of aging patients. Emphasis is placed on the fact that old people withstand surgical intervention and severe illness well if given proper medical treatment.

The first section of the book presents basic considerations of geriatric medicine including general principles anatomic physiologic and intellectual changes and the essentials of medicine surgery and nursing in connection with the treatment and guidance of aging people in health and in illness. Other sections give a clear and comprehensive discussion of disorders of metabolism and the various body systems of the aging and the aged.

Each chapter has a summary and a pertinent list of references many contain charts tables and photographs. The entire book is exceptionally well edited and will be highly interesting and helpful to all physicians in prolonging the life and usefulness of their aging patients.

—PATRICK I McSHANE C I MC USA

THE SCIENCE OF DENTAL MATERIALS by *Eug W Skinner* Ph D
4th edition 456 pages illustrated completely revised and rewritten
W B Saunders Co Philadelphia Pa 1954 Price \$7.50

The fourth edition of this excellent textbook has been revised and almost completely rewritten. It is designed primarily for the dental student and presents the scientific data and background necessary for the understanding and proper use of the materials employed in the practice of dentistry. The data presented will help solve most of the day to day problems of the dental practitioner. The dentist who follows the procedures discussed by the author will improve the service furnished his patients.

The chapters have been rearranged and the illustrations are improved. The information pertaining to hydrocolloid impression materials synthetic resins and gold inlay casting procedures has been expanded and brought up to date. New chapters covering zinc oxide eugenol pastes cobalt chromium alloys and wrought base metal alloys have been added while data concerning out-of-date materials have been condensed or deleted. Complete and current bibliographies follow each chapter. The appendix contains the latest American Dental Association specifications for the various materials. This well written easily read and readily understood volume will be equally valuable to the student and the practitioner. —EDWIN H SMITH J L Col DC USA

LECTURES ON GENERAL PATHOLOGY d t d by S How d Fl y 733
 pag 11 strat d W B S nd C Ph lad lph P 1954 P c
 \$13

Th s lectures on th princ ples and problems of physiology and bioch mistry are drawn f m the course n Gener l P thology nd B cter ology gi en n Oxford Accordi g to the d tor they a de gned prima ly for the b tter student dur ng hi preclinic l training but assuredly they are of valu to tho e more advanc d in medical training a hope exp ssed by the editor in the p eface There are 36 lectures on v rious asp cts of body r acti n to njury The subjects d scus d are infl mmat on re ction of the blood to i jury f ver effects of radiant energy r act ons to vi use and bacteria imm nity he ling nd egeneratio There l are lectures n hock ed ma tuberculosi nd the infl ce of drug on inflamm tory proc se

The fir t l ctur on th h story nd ope of p thology s well done and is illust ated by n merous reproduct ons of print and photogr phs many f hi t cal ntere t The mat ial s well ga z d n each lecture The atf l prese tatio with emphasis on e p mental in ve tigation nd on defici cies in pr m understand ng of much th t s inv lved n these react ons s well calculated to stim late an ex periment l outlook in cl cal medic ne and surgery A bl nd ng of philo ph cal with cientific thought detracts in no way from th s object ve Emphasi on experimental science in the trai g of f tur clinicians m y be debated but not in a crit que of th s book for such mphasi i n acknowl dged int t

Reproduct ns of photographs and prints photom crogaphs line dr wigs and g aphs ha e been us d lber lly The bibliographies fter ch chapt r are fai ly exten iv and a c mplete a thor index is ncluded Unfortun t ly the subject ind x s scant and thi l mits the u fulnes of the book as a eady r ference work fo p thologists fo wh ch the contents are so well de igned howe r th vol me s highly recommended r adi g for d anced students and fo phys ci ns w th nterest in some f the p sent-day views ab ut the nature and aus f body re ponse to njury—WILMOT F PIERCE *Comdr (MC) USN*

HEART DISEASE AND INDUSTRY by M y T M D 324 pag G
 & S I N w Y k N Y 1954 P \$7 50

The first f ts kind this unusual book s writt n for memb rs of the l gal a well m d cal profe n It c nta n individual case repo t of 100 wo kmen compensat n c s e ch w th the uthor s pin o r g ding th ous l g l aspect especially the usal relati ns b twe n ndust ial ccid nt ccid ts d conditions and a diov cul d se e The b ok s rai ly co cerned w th myo cardal i fa ct o It s th uthor s th s that th e c be c us l relation between ndust ial factor nd the d sease as the natural histo y and m l prog ess of rteri clero i s not influe d by

outside factors such as effort emotional disturbances or nonpenetrating chest trauma. He also states that contusion of the left ventricle from nonpenetrating injury to the chest due to blunt force does not occur as an isolated process. The case reports comprise over 75 percent of the book. The concluding section of 40 pages is a review of significant literature on coronary occlusion with 230 references dated from 1856 to 1953.

This book has value as a signpost in a rapidly growing field of medical and legal interrelations. For the military physician a short perusal of the book will give him a better understanding of civilian medicolegal aspects of cardiovascular disease.

—PICHARD P. JOHNSON Col. MC USA

LAUGHTER IN HELL by Stephen Mack 256 pag. illustrated Th. Caxton
Printers Ltd. Caldwell Idaho 1954 Price \$5

To the growing prisoner of war literature of World War II the author has added an interesting account of the experiences of a small group of American naval and marine personnel in prison camps in Japan. *Laughter in Hell* is the experiences of Lieutenant E. L. Guirey, USN, Technical Sergeant H. C. Nixon, USMC, and their comrades in Japanese prison camps in Osaka and Tsuruga from 1942 to 1945 where they worked unloading and transferring freight and cargo. The simple straightforward story is written in a calm dispassionate manner. Mostly episodic in treatment it contains much that is familiar in the POW story: food shortages, illness, and Japanese mistreatment. It reflects the quiet heroism and sacrifice of men who did not abandon themselves to their fate.

But these themes are not dwelt upon nor is any self-pity evident. Instead Mr. Mack has written a highly descriptive account of what Guirey, Nixon, and their comrades did to meet their situation. Therein is the value of the narrative in POW literature. Because as POWs they often handled food shipments they were able to organize and co-operate effectively to pilfer cargo, provide for themselves and their fellows, and to pay off their Japanese co-workers and guards. The lessons these men learned are evident and positive: they quickly came to realize that strong leadership, co-operation, close organization, and high morale were the keys to making POW life bearable. One way of keeping morale high appears to have been razzing rather than sympathy when spirits were low.

To the reviewer also a former POW of the Japanese, this account of POW life revealed the range of experiences of other groups which were somewhat different from his own. It left the reviewer with the thought that experiences such as these and the lessons of POW life should be imparted to all in our military services. Such education might have gone a long way toward preventing the "progressives" of the Korean war. —KARL H. FOUGHTO Col. USAF (MC)

ENCYCLOPEDIA OF CHILD CARE AND GUIDANCE d t d by S d
 Mat G b g 1 016 pag II tra d D bl d y & C I
 Ga d C ty N Y 1954 P \$7 50

This large volume is designed to help each reader to develop a personal guide for successful living with children. Of its two parts the first is an encyclopedia of 604 pages and more than 1 000 entries. A sample sequence of subjects includes chloromycetin, chickenpox, chorea, cholestasis, Christmas, chromosomes, circumcision, and citizenship. A list of national agencies dealing with problems of children and some 43 pages of references for further reading is also included. Part II consists of 30 articles with such titles as Family Life, Changing, What We Know about the Development of Healthy Personalities in Children, Handling a Baby, Infancy, Early Steps in Growing Up, The School Year, Adolescence, Being Father Today, Music for Children, and Married Love and Parent Love.

This book is an ambitious undertaking and represents a great amount of effort on the part of the editor and collaborating experts. It contains something for everybody in a kind of middle of the road approach. The real value of the book will depend to a large extent on the attitude of the person using it. Material can be found and quoted to support either an authoritative or a flexible approach to the problems of children or adults. Here lies both the strength and weakness of the book.

Human behavior does not lend itself to capsule or cookbook treatment where a symptom can be treated or even dismissed as isolated form. The encyclopedia portion of the book can be misleading if the parent attempts to apply literally what is general information to the solution of a problem in his own particular child. The sections on national agencies, additional reading, and the separate papers are in general well written and useful. In summary, this encyclopedia will not do a great deal of harm and some persons may find it helpful.

—JOHN M. CALDWELL, Col MC USA

CLINICAL ENDOCRINOLOGY by K I E P bk M D Ab h m E
 Rak ff M D d Ab ham Ca ta ou M D 830 pag 53 ll
 ra ns 5 f ll l P l B Hoebe In N w Y k N Y 1954
 P \$16

In the preface to this new textbook in endocrinology the authors state that clinical endocrine disorder can be understood fully when seen in problems in pathologic physiology. With this notion can disagree. To a great extent they have succeeded in presenting the clinical picture of endocrine disorder from this point of view. Embryology, anatomy, physiology, pathology, diagnosis, and treatment are discussed in sequence.

Less detailed than some other texts, the book has gained in readability. Particularly welcome is the frequent use of the personal pronoun. We, Their experiences, and personal views lead withity to their discussion.

About one third of the text is devoted to the ovary testes and placenta probably reflecting the interest of one of the co authors. The section on obesity is adequate although the references are from 1939 to 1949 only. The chapter on diabetes covers the main points but as the authors say a more extensive treatment of the subject would fill the entire volume. Most of the 253 illustrations are excellent and original. Readers will find the section on methods and procedures particularly helpful. There is also a useful table of commercially available hormone preparations. The heavy glossy paper and large type make for easy reading although at a rather substantial price. A complete index enhances the value of the book.

In short this is a well written concise summary of the important clinical aspects of the wide field of endocrinology. It is one of the better texts on the subject —S O WAIFE, LI (MC) USNR

ANESTHESIOLOGY Donald E Hale, M D, Supervising Editor, 756 pages, 149 illustrations, F A Davis Co, Philadelphia, Pa, 1954, Price \$15

This is a comprehensive symposium on the art and practice of anesthesia by 40 authors from all sections of the country. The authors are all well known and fully qualified to contribute their respective sections, many of them having previously published books on this subject. The volume incorporates an excellent over all coverage of anesthesia.

This book is printed in double columns making it easy to read and the subjects are current, clear and concise with liberal references following each chapter. The first two chapters deal with physiology and pharmacology which are essential in any book on anesthesia. Other chapters cover agents, methods, problems and complications. Of special interest is the chapter on muscle relaxants particularly because their use has caused a profound change in clinical anesthesia. The use of relaxants in fields other than anesthesia is also summarized.

The chapters on pediatric anesthesia and resuscitation are excellent. Some of the most important advances in recent years which have contributed greatly to the specialty of anesthesia have been in these two fields. The author of the chapter on resuscitation states that all physicians should have instruction in the use of anesthesia equipment and the methods employed. In the delivery room, initiating and maintaining proper breathing of the infant at birth can be one of the truly lifesaving services performed by the physician. The authors on pediatric anesthesia believe that the infant or child is a pocket size edition of the adult in most respects; this serves to justify their contention that if an anesthetic agent is used successfully in adults it can also be used successfully in children.

This volume should prove of definite value to anesthesiologists and to those in anesthesia training —JOHN J. MARRA, LI (MC) USN

NUTRITION AND PHYSICAL FITNESS by L J B g t Ph D 6th d o
664 pag ll strat d W B S d C Ph l d lph P 1954
P \$4 50

This new edition succeeds in meeting its objective to present a wide range of facts about nutrition in such simple language as to be understandable to those without previous knowledge of chemistry and to point out how such knowledge may be utilized for promoting a high degree of physical fitness. Over 60 percent of the text is entirely new and the remainder has been thoroughly revised.

The first half of the book is devoted to body needs in terms of the required nutrient presenting essential facts about the foods which supply those nutrients and the results of inadequate or excessive intakes of the various elements. The material is developed logically and presented simply but forcefully. Part two, Body Processes, emphasizes that there is more to nutrition than food and discusses the body as a whole with special reference to the digestion and absorption of food, metabolism and influence of the ductless glands and problems of excretion. The third part, Meal Planning, outlines in usable form the basic rules for planning good menus. By the use of graphs and detailed explanations it shows how to plan nutritionally adequate diet at different cost levels on the basis of 1953 food prices. In the area of food fads and fancies 10 pages are devoted to the refutation of the most common errors. The final section, Diet for Special Conditions, presents the dietary requirement in pregnancy for childbearing women over 40 and a condition of overweight and malnutrition.

This book will be highly useful to physicians and dietitians as a textbook in the conduct of nutrition programs for lay groups. It is also particularly well suited for use as a study reference by the wives and mothers in whose hands lie the nutritional welfare of the family.

—MIRIAM E. PERRY Col USAF (WNSC)

PROFESSIONAL NURSING Textbook by E g A nedy
Sp l d g R N M A 5th d d d e 636 p g
52 ll strat J B L pp t Co Ph l d lph Pa 1954 P
\$5

This book was written as a text in basic programs in nursing for senior nursing students but will be of value to the young graduate nurse beginning the practice of her profession. The book is divided into an introduction, four units and an appendix. The introduction discusses problem-solving techniques and includes vast amount of reference material.

Unit I deals with the status of nursing at present and discusses some of the events, movements, trends that have affected nursing as a profession and how these trends affect the nurse herself. Unit II deals with choosing a field of work and succeeding in it. The student learns what fields of nursing are open to her and all of the

importance of making a wise and careful selection when accepting a position. The author points out the need for self-evaluation and re evaluation of motives in choosing a particular profession. Unit III deals with professional organizations and activities discussing in detail each major nursing organization its objectives activities program and reasons for membership. The author has designed Unit IV to help the nurse understand some of the major issues and situations that will confront her in the search for security and in striving for good legal and professional relationships. The nurse's legal responsibility as well as her legal rights are stressed. Problems relating to economic security are brought to the student's attention.

The fifth edition of this book contains a wealth of new and useful material for all nurses. It is a valuable reference book as well as a text and is recommended for the libraries of all schools of nursing.

—BERTHA ELSNER Lt Col USAF (AFNC)

PHYSICAL ASPECTS OF BETATRON THERAPY by John S. La gbl n.
 American Lecture Series Publication Number 196. A Monograph in
 American Lecture in Medical Physics. 98 pages illustrated. Charles
 C Thomas Publisher Springfield Ill. 1954. Price \$3.75.

This monograph is a technical treatise on high energy x rays and high energy electrons discussing in the first two sections their physical aspects and methods of production localization and monitoring. The physical aspects of absorption and calibration of both intensity and dose in absolute units are discussed in detail. Factors in the clinical application of both of these beams of energy in therapy are well presented including tabulated comparisons of such ratios as tumor dose to integral dose with both high and low energy x rays. The relative biologic effectiveness of these high energy electron and x ray beams are compared with low voltage x rays. No clinical data is presented.

The format of this monograph is excellent the illustrations are clear and accurate and the experimental data well tabulated and conveniently arranged. It is well indexed and presents a good bibliography. This is a valuable contribution to the field of high energy radiation and as the author states the data presented should be applicable to such other high energy sources as the synchrotron and linear accelerator. Physicists and radiologists as well as students working with high energy radiation should find this monograph a valuable addition to their ready reference bookshelves. —JOHN A. ISHERWOOD Col MC USA

AMERICAN NURSING History and Interpretation by Mary M. Roberts R N
 688 pages illustrated. The Macmillan Co. New York N Y 1954.
 Price \$6.

In one of the most dynamic and comprehensive histories of nursing yet published Mary Roberts has made a brilliant chronological survey

of the growth and development of this profession from 1900 to 1952. The author, who has been one of the foremost figures in the profession for over a quarter of a century, has given the reader a clear picture of nursing as an integral part of the many health organizations of the world. Further, she has pointed out the effects of the political, social, and economic trends on nursing and the influences of nursing expansion on society.

The first sections of this text discuss the early struggles of the nursing profession, the advances in nursing education, and the development of federal and military nursing services. There is an excellent chapter devoted to male nurses, relating their increasing number and acceptance. There is also an enlightening and highly informative chapter on unified world health achievements and programs.

An extensive bibliography at the end of each chapter should be of great value to the reader who is interested in further research and study. This text should serve as a stimulus to the professional nurse in that it summarizes for her a complete history of what nursing has done in the past, what nursing is now doing, and what are the trends for the future.—ANNETTE BAER, Lt (NC) USN

PRINCIPLES OF OCCUPATIONAL THERAPY, edited by H I S W illard
O T R, ed Clara S Spelman, M S (ED) O T R 2d ed
376 pag, 61 figures, hard cover, J B Lippincott Co, Phila
delphia, Pa, 1954, P \$5.50

This second edition is a timely contribution to professional literature and to the rapidly expanding field of occupational therapy. The authors were painstaking in their research and present in a stimulating and interesting manner the basic concepts and principles in the rehabilitation of the physically and mentally handicapped. The many contributors to the book are outstanding in their specialties. Their presentations lend vivid and realistic views on the topics discussed.

Although little space is allotted to occupational therapy in military hospitals, the treatments and circumstances are depicted in their truest light. The illustrations on joint measurement are practical both as teaching and reference aids. The chapter on physical injuries has been extensively revised and much information added. The treatment of anterior poliomyelitis is discussed thoroughly and effectively.

Much material for the book was drawn from a rich source of bibliographies, borrowed quotations from authorities in other professions enrich the book considerably. The index is complete and excellent.

The book was edited primarily for the practicing therapist and will serve her as a valuable guide and reference book. The book is so well written, however, and contains so many lucid explanations for the treatment of the disabled that workers in allied professions also should find the book informative and helpful.

—VERONICA M BULSHEFSKI, Lt (NC) USN

New Books Received

Books received by the *U S Armed Forces Medical Journal* are acknowledged in this department. Those of greatest interest will be selected for review in a later issue.

- BABCOCK'S PRINCIPLES AND PRACTICE OF SURGERY** edited by *Karl C. Jonas* B S M D M S (Surg.) F A C S F I C S Department of Surgery Temple University School of Medicine and Hospital Philadelphia Pa 2d edition 1543 pages with 1006 illustrations and 10 colored plates Lea & Febiger Philadelphia Pa 1954 Price \$18
- THE SCOURGE OF THE SWASTIKA** A Short History of Nazi War Crimes by *Lodovico L. Pool* C B E M C 259 pages with 16 pages of halftone illustrations Philosophical Library New York N Y 1954 Price \$4.50
- CYSTIC FIBROSIS OF THE PANCREAS IN INFANTS AND CHILDREN** by *Charles D. May* M D Professor and Chairman Department of Pediatrics State University of Iowa Iowa City Iowa American Lecture Series Publication Number 234 A Monograph in American Lectures in Pediatrics Edited by *John A. Anderson* M D Professor and Head Department of Pediatrics Stanford University School of Medicine San Francisco California 93 pages illustrated Charles C Thomas Publisher Springfield Ill 1954 Price \$3
- GUIDE FOR SAFETY IN THE CHEMICAL LABORATORY** Prepared by and Published for The General Safety Committee of the Manufacturing Chemical Association Inc Washington D C 234 pages illustrated 39 plates D. Van Nostrand Co Inc New York N Y 1954 Price \$4.25
- THE PRACTICE OF SANITATION** by *Edward Scott Hopkins* Principal Assistant Engineer Bureau of Water Supply Baltimore Md Colonel Medical Service Corps (Sanitary Engineering Section) United States Army Reserve Instructor McCoy College John Hopkins University and *Wilhelm Henry Schilke* Director Sanitary Section Baltimore City Health Department 2d edition 466 pages illustrated The Williams & Wilkins Co Baltimore Md 1954 Price \$8
- A TEXTBOOK OF CHEMISTRY** by *Stella Goostray* R N B S M Ed Director Emory School of Nursing The Children's Hospital Boston Formerly Editorial Director and Instructor in Chemistry School of Nursing Philadelphia General Hospital and *J. Rae Schwenck* A B Ch E Instructor in Nurses Chemistry and in Organic Chemistry Sacramento Junior College Lecturer in Organic Chemistry Sacramento State College 7th edition 426 pages illustrated The Macmillan Co New York N Y 1954
- HUMAN BIOCHEMISTRY** by *Israel S. Klein* Ph D Professor of Biochemistry and Director of the Department of Biochemistry New York Medical College Flower and Fifth Avenue Hospitals Formerly Assistant The Rockefeller Institute for Medical Research New York N Y 4th edition 746 pages 93 text illustrations and 5 color plates The C. V. Mosby Co St. Louis Mo 1954 Price \$7.50

THE CONCEPT OF SCHIZOPHRENIA, by W F M A l y M D Belf D P H
 R C P S I P pal P y h tr R g tra D w h H sp l
 N h l la d L Surg L t t R N V R w th F
 w d by J h H Ew F B C P D P M Fome ly Phy ia d
 L tur P y h l g c l M d t h W tm H p tal 145
 pag Ph l ph l L bra y N w Y k N Y 1954 P \$3 75

CLINICAL APPROACH TO JAUNDICE by L S b // M D Ph D P
 f r of Clin l M d D p m t f l a l M d U
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 pag ll tra d Ch l C Th m P bl h Sp g f l d Ill 1954
 P \$3 75

ADMINISTRATIVE MEDICINE T f th S d C nf 8 9
 d 10 D mb 1953 P t N J d t d by G org S St ns
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 M t l H lth N w Y k N Y 164 p g Sp d by h Jo h
 M y J F nd N w Y k N Y P d by C l M y & C
 l N w Y k N Y 1954 P \$3

ATLAS OF MEN A G de f S mat typ g h Ad lt M l t All Ag s by
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 Dall T 357 p g ll tra d H p & B P bl h N w
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 C Th ma P bl h Sp g f l d Ill 1954 P \$4 75

CLINICAL MEASUREMENT OF UTERINE FORCES IN PREGNANCY AND LABOR by *S R M Reynolds* Ph D D Sc Staff Member Department of Embryology Carnegie Institution of Washington Lecturer in Obstetrics The John Hopkins University School of Medicine Baltimore Md Prof sso Honorary Faculty of Medicine Montevideo Uruguay
Jerome S Harris M D Department of Obstetrics and Gynecology University of Colorado School of Medicine Denver Colo and *Iruin H Kaus* M D Ph D Department of Obstetrics and Gynecology University of Minnesota Medical School Minneapolis Minn 328 pages illustrated Charles C Thomas Publisher Springfield Ill 1954 Price \$9 50

FACTORS AFFECTING THE COSTS OF HOSPITAL CARE Volume 1 Financing Hospital Care in the United States edited by *John H Hayes* 300 pages illustrated The Blakiston Co Inc New York N Y 1954 Price \$4

PRINCIPLES AND PRACTICE OF ANTIBIOTIC THERAPY by *Henry Welch* in collaboration with *Betty Clark Dowling* *Fredland* *Hirrell* *Hirschman* *Hobby* *Keefe* *Knight* *Pulaski* *Rosen* *Smadel* *Winsten* *Woodward* *Zander* Specially edited by *Felix Watz* 699 pages Published by Medical Encyclopedia Inc Distributed by Blakiston Co New York N Y 1954 Price \$12

THE NEW WARFARE by *Bogdan C N Baclay* C B E D S O 65 page Philosophical Library Inc New York N Y 1954 Price \$2 75

CLINICAL PATHOLOGIC CONFERENCES OF COOK COUNTY HOSPITAL Volume I Cardiovascular Renal Problems edited by *Hans Poppe* M D Ph D Director Department of Pathology Cook County Hospital Scientific Director Hektoen Institute for Medical Research of the Cook County Hospital Associate Professor of Pathology Northwestern University Medical School and *Daniel S Kushner* M D Associate Director of Medical Education Cook County Hospital Research Associate Hektoen Institute for Medical Research of the Cook County Hospital Clinical Assistant in Medicine and Fellow in Pathology Northwestern University Medical School 325 pages illustrated The Blakiston Company Inc New York N Y 1954 Price \$5

THE SEXUAL NATURE OF MAN and Its Management by *Glenn Leuba* Professor and Chairman Department of Psychology Antioch College Doubleday Papers in Psychology DPP 6 Consulting Editor *Eugene L. Hatfield* Professor of Psychology The City College New York N Y 40 pages Illustrated Doubleday & Co Inc Garden City N Y 1954 Price \$0 85

NECK DISSECTIONS by *James B Brett Brown* M D Professor of Clinical Surgery Washington University School of Medicine St Louis Missouri Chief Consultant in Plastic Surgery United States Veteran Administration Washington D C and *Frank McDowell* M D Assistant Professor of Clinical Surgery Washington University School of Medicine St Louis Missouri American Lecturer Series Publication Number 207 Monograph in The Banister Division of American Lecture in Surgery Edited by *Michael E DeBakey* M D Professor of Surgery and Chairman of the Department of Surgery Baylor University College of Medicine Houston Texas and *Glenn Spurling* M D Clinical Professor of Surgery University of Louisville Louisville Kentucky Plastic Surgery Division edited by *James Brett Brown* M D Professor of Clinical Surgery Washington University School of Medicine St Louis Missouri Chief Consultant in Plastic Surgery United States Veteran Administration Washington D C 163 pages illustrated Charles C Thomas Publisher Springfield Ill 1954 Price \$7 50

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d l p h S h l f O c p t n a l Th p y d C l S S p a k m a B S
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U y f P y l S h l f A u x l i a y M d l S
D t C u r W k s h o p n d D o r O p a t n a l Th r a p y D
p a m e H p l f h G d S h l f M d U r t y f
P n n y l n A n D i P h l a d l p h S c h l f O c p a n a l
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f P y h t y M G l l U v t y 495 pag J B L p p n t t C o
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T r a g Th A m y S h l f R g l g y A t P l
D g s R o e g l g y Th F r a k E B E d n a l l
C l v l a d C l F d t o S f f D p a m e f R t g e l g y
C l l a n d C l F n d 488 pag 734 ill u s a t n s C h a l C
Th m a P b l h S p g f l d i l l 1954 P \$18.50

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FOREWORD

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Monthly Message

This is an advance welcome to the Association of Military Surgeons who will meet with us here in Washington at the end of the month. This Association holds the unique distinction of being semiofficial in nature in view of the fact that it was established by Congress many years ago to promote better relations between the military and civilian arms of the medical profession and a better understanding of military medicine by nonmilitary persons. These days when there are so many national, state, local, and social medical organizations from the American Medical Association down to the smallest group of ten or a dozen doctors gathered for a pleasant evening together, it is difficult to choose which to attend. The Association of Military Surgeons has an unusually good program this year with much of interest for all doctors who have an interest in the maintenance of strong military departments. This office sincerely hopes that there will be a generous attendance at the meetings and wishes to take this opportunity to afford the Association a most hearty welcome to the city. We appreciate your presence here and trust that you will find your stay both enjoyable and profitable.

Frank B Berry

FRANK B BERRY M D
Assistant Secretary of Defense
(Health and Medical)

AN OBJECTIVE TEST FOR ASTHMA

JACQUES L. SHERMAN Jr Major MC USA

THE need for some objective procedure in the diagnosis of bronchial asthma has been obvious for many years. Because the patient is often without symptoms and the characteristic signs the diagnosis must frequently rest for some time on the history and exclusion of other conditions. Based upon certain fundamental studies, a simplified test has been developed¹ which can be of aid to the clinician in establishing the diagnosis of bronchial asthma.

EXPERIMENTAL AND PHYSIOLOGIC BASIS

Many incidental observations have been made during pharmacologic and physiologic studies indicating that certain drugs could produce asthmatic attacks in patients known to have bronchial asthma. In studies on the effects of histamine on the cardiovascular system Weiss and associates² observed that in patients subject to bronchial asthma attacks were often precipitated by administration of small amounts of this drug. Later investigations led to the conclusion that histamine had no measurable effect on the respiratory system of normal persons, and that patients with asthma do not react with increased sensitivity but with altered response (idiosyncrasy) to histamine.³

Similarly Alexander and Paddock had observed and then investigated the effect of pilocarpine in asthmatic subjects. They showed that asthmatic attacks could be induced in susceptible persons by subcutaneous injection of small amounts of pilocarpine. Subsequent reports have demonstrated the effectiveness of small doses of other parasympathomimetic agents such as methacholine chloride (acetyl beta methylcholine chloride),⁴ carbachol (carbaminoylecholine chloride),⁵ and acetylcholine chloride. Villaret and others⁶ were able to provoke attacks in persons subject to asthma at will and to end these attacks with atropine. All of these observers noted the fact that such "asthma like" attacks could be produced only in susceptible subjects, and that these drugs had little or no effect on the respiratory function of normal persons. Hurtado and Kaltreider, however demonstrated some reduction in vital capacity in two normal

From Walter Reed Army Hospital, Washington, D. C. Mr. Sherman is now a student at U. S. Army Hospital, Fort Belvoir, Va.

subjects by using larger doses (15 and 30 mg) of methacholine chloride

On the basis of these and other reports Curry¹ and Curry and associates made careful quantitative observations on the effects of histamine and methacholine chloride in normal persons in persons with other allergic diseases and in persons with bronchial asthma. They demonstrated that these drugs would produce significant changes in the resting vital capacity maximum breathing capacity and rate of maximal expiration in subjects with bronchial asthma. Analysis of results showed that age sex or the presence of hay fever eczema or urticaria in the patient or of history of these conditions in the patient's family appeared to have no influence on the subject's susceptibility to the two drugs. In addition a general relationship between the severity of the asthma and the response to the drugs was seen.

TEST PROCEDURE

Patients were tested under the following conditions adopted from Curry. Tests were conducted at least two hours after a meal when the subject had rested 20 minutes and had had no medication for 12 hours prior to the test unless the effects of specific drugs were being evaluated. The nature of the test was explained to assure co-operation but the expected results were not indicated in any way.

In order to avoid variations in absorption test drugs were given rapidly by vein. Histamine phosphate was given in a dosage of 0.3 mg of histamine base. Methacholine chloride 1:1000 solution was prepared in sterile distilled water. If refrigerated this preparation retains its potency for about one month. The standard test dose was 0.5 mg given as 0.5 cc of the prepared solution.

Serial determinations of vital capacity were made 30 seconds after injection one minute after injection and at one-minute intervals until the patient's vital capacity had returned to or near the baseline. In addition to measuring vital capacity the examiner listened to the patient's chest during the procedure to detect the presence of changes in physical signs which may give additional information. At the conclusion of each test the patient was questioned as to any subjective changes—substernal compression dyspnea wheezing et cetera. Usually the patient was unaware of any pulmonary symptoms during or after the test.

Control tests may be done by using physiologic saline in place of the other test drugs. If the patient is not informed of the substitution and if the test procedure is not modified in any other way the examiner can satisfy himself that psychic factors do not influence the vital capacity. When this was done in this

series, only one patient showed any significant variation, this was an increase of 20 percent in the recorded vital capacity. The subject reported that "the drug made me feel nervous in side "

PRECAUTIONS SIDE EFFECTS REACTIONS

Before any testing is done, the patient's current physical status must be determined. The presence of any cardiac arrhythmia, marked hypertension, or an asthmatic attack must be considered contraindications to testing. Due to the well known effects of histamine on the circulation the patient may be expected to develop at least an intense flush over the face, and a headache. The headache may be transient or persistent enough to require treatment but it does not interfere with the performance of the test if the patient has been forewarned. No significant change in blood pressure should be expected unless the patient should happen to have a pheochromocytoma.

No important side effects have been observed following the administration of the test dose of methacholine chloride.

In Curry and Lowell's¹² experience and in my own, few reactions have occurred. In two of my patients given methacholine chloride, almost complete apnea developed but normal respirations returned within 30 to 40 seconds in both patients. In one patient being tested with histamine a shocklike state developed which disappeared within two minutes following suitable treatment. After receiving methacholine chloride, one other patient developed a supraventricular tachycardia, which spontaneously reverted to normal rhythm in 40 minutes. Because of the possibility of such reactions, a syringe loaded with epinephrine should be kept on hand.

METHOD AND RESULTS

In this series tests were recorded where possible on a waterless basal metabolism apparatus in order to obtain a permanent record but any standard method of obtaining vital capacity is satisfactory.

The results of tests were obtained in a group of 50 patients. Their age range was from 17 to 69 years all but two were men. Responses to the tests were graded as shown in table 1 and the over all results by class of patients are given in table 2. Patients listed as showing a positive response were those whose vital capacity was reduced 11 percent or more by histamine methacholine chloride, or both.

Control Group Nine subjects were selected for testing in whom there was no history or evidence of respiratory disease. Two of

them showed a positive response. One had a 12 percent reduction of vital capacity following injection of histamine. It was of interest that a more careful check of his history after the test revealed that for four years prior to the testing the subject had had occasional episodes of wheezing when exposed to damp climate plus physical exertion. The other a medical officer had a fall in vital capacity after a test dose of methacholine chloride. In this case no additional history could be obtained.

TABLE 1 *Grading of response*

Change in vital capacity (Percent)	Grade	Response
Any or 0 to -10	0	None
-11 to -20		Modest
-21 to -39		Mild
-40 or more		Very marked

Patients With Other Respiratory Diseases In this group of 11 patients four showed a positive response: two to histamine, one to methacholine chloride, and one to both drugs. Ten patients were diagnosed as having chronic bronchitis with bronchospasm, and one had the diagnosis of rhinitis vasomotor perennial. These diagnoses were made by the responsible ward officers and agreed with those from the hospital's allergy clinic.

TABLE 2 *Summary of test results*

Subject	Number	Positive	Negative
Control	9	2	7
Patients with pulmonary disease	11	4	7
Patients with bronchial asthma	30	30	0

Patients With Asthma Positive responses were obtained in all 30 patients in whom this diagnosis had been made and established on clinical grounds. Of these seven gave positive responses to histamine, eight to methacholine chloride, and 1 to both drugs.

ILLUSTRATIVE TEST RESULTS

Case 1, Control Group This 33 year old medical officer gave no history of respiratory tract disease. During and after the test no subjective sensations related to the chest were reported.

Test number	Date	Drug	Initial vital capacity (cc)	Percent of change
1	23 Feb 1950	Histamine	4890	-3
2	27 July 1950	Methacholine chloride	4500	-5

Case 2 Asthma Group This 32 year old soldier had one attack of wheezing in June 1948. There were frequent attacks in May 1950. Physical examination at the time of testing was completely normal, and no symptoms were reported during the tests. This man proved to be sensitive to methacholine chloride and not to histamine.

Test number	Date	Drug	Initial vital capacity (cc)	Percent of change
1	6 Nov 1950	Histamine	5205	-2
2	6 Nov 1950	Methacholine chloride	5900	-32
3	6 Nov 1950	Meth choline chloride	5600	-37

Case 3 Asthma Group Both parents of this 32 year old soldier had asthma. The onset of his attacks occurred one year prior to testing. Physical examination revealed frequent rales and expiratory wheezes.

Test number	Date	Drug	Initial vital capacity (cc)	Percent of change
1	7 Feb 1951	Meth choline chloride	4022	-40
2	8 Feb 1951	Saline	3650	-1
3	9 Feb 1951	Histamine	3786	-14
4	20 Feb 1951	Methacholine chloride	3921	-43
5	24 Feb 1951	Meth choline chloride	3887	-44
6	27 Feb 1951	Water	4157	-8
7	28 Feb 1951	Meth choline chloride	3853	-41

This patient reported wheezing following injection of histamine (test 3) but no change in physical signs was detected by the examiner during the procedure. The reproducibility of the test response is well demonstrated here. Not all patients showed such similarity of response on repeated tests but only rarely were the results of successive tests significantly different. There was also a lack of important response to the injection of inactive substances.

PROTECTION STUDIES

Although the purpose of this article is to present a diagnostic aid the principle of protection should be mentioned as it may serve in interpretation of results. According to the testing procedure before the test is repeated anticholinergic agents are given to those patients whose primary sensitivity is to methacholine chloride. The belladonna alkaloids aminophylline, epinephrine, and methoxyphenamine hydrochloride (orthoxine hydrochloride) gave significant protection against the reduction of vital capacity due to injected methacholine chloride. Oral antihistaminic agents have afforded similar protection to patients who are sensitive to histamine. Satisfactory protection consists of reducing the fall in vital capacity by 50 percent or more. For example, on 12 February 1951 a histamine test was performed on the patient cited in test case 3 two days after he had been placed on an oral antihistaminic and he demonstrated a fall of only 14 percent in vital capacity as compared to a 44 percent reduction without this protection. Similarly, he showed a reduction of vital capacity of 10 percent when 0.65 mg. of scopolamine had been given sublingually 50 minutes before retesting with methacholine chloride.

In a small series of patients clinical protection has been accomplished by the use of either antihistaminic or anticholinergic drugs selected according to the results of testing. It is obvious that because epinephrine is both an antihistaminic and an anticholinergic agent it will provide relief or protection for a patient no matter what his mechanism of response. Further studies along this line are definitely indicated.

DISCUSSION

The results in this series of 50 patients show that while all asthmatic patients gave a positive response to the test, six in the group of nonasthmatics also gave this response.

Thus it is clear that, while a positive response does not establish the diagnosis of asthma, a negative response would help to rule this out. This procedure like almost all others in medicine must be evaluated as a part of the entire examination. I

believe however, that at present it represents an important diagnostic aid available to the physician, because skin testing is a nonspecific procedure related more to diathesis than to disease entity

Use of such a procedure may be of benefit in the screening of persons who present themselves at an induction center with a history suggestive of asthma. In such persons, definite, positive tests might warrant further observation before induction because the military value of a chronic asthmatic is limited.

On the other hand, negative results would aid the examiner in his evaluation of the person's fitness for military service. Similarly such screening might prove helpful in evaluating applicants for service academies or for other special training. In smaller military hospitals where the question of disposition to the front or to the rear depends on definitive diagnosis, such a test may be practical.

The pathophysiologic implications of the test are of great interest. Because certain asthmatic patients will have a reduction of pulmonary function following injection of histamine while others will respond only to methacholine chloride, it follows that in asthma at least two abnormal pathways must exist for the production of the attack. The possibility of a third mechanism is suggested by the reduction of vital capacity in asthmatics following inhalation of aerosolized pollen extracts.¹⁻¹⁵ It seems more likely, however, that contact of these pollens with bronchial mucosa sets up either a "cholinergic" or a "histaminic" mechanism, because no patient with asthma studied by this technic has failed to respond to the introduction of either methacholine chloride or histamine. Certainly, further elucidation of these pathways or mechanisms will be productive in increasing our knowledge of the pathogenesis of asthma. For example, a form of surgical treatment for intractable asthma consists of destruction of the parasympathetic (cholinergic) nerve supply to the lung and bronchi, usually on the left side, but sometimes bilaterally. One published series¹⁶ indicated good results in 22 of 38 patients so treated. It may be pertinent to suggest that better results might follow selection of patients for parasympathetic denervation from among those whose primary sensitivity was to a parasympathomimetic drug, rather than from a group whose test results indicated histamine sensitivity.

SUMMARY

A simple clinical test here described can aid in the diagnosis of bronchial asthma. All members of a group of 30 patients with clinically diagnosed asthma showed positive tests. Among 20 nonasthmatic subjects six positive tests were recorded. This

procedure might be particularly valuable to the military service at induction centers when screening persons with histories suggestive of asthma or in smaller military hospitals where the problem of evaluation of asthma is difficult.

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A MISSING LINK IN THE HISTORY OF HISTOPLASMOSIS IN PANAMA

LORENZ E ZIMMERMAN *Lieutenant Colonel MC USA*

HISTOPLASMOSIS was first described from Panama by Darling¹ in 1906. During an 8 month period between December 1905 and August 1906 he encountered three cases at autopsy at the Board of Health Laboratory, Ancon, C. Z. His studies on the lesions and the causative parasite led to further publications^{2, 3} in 1908 and 1909. Histoplasma infection was not again described from Panama until 1945 when Tomlinson and Grocott reported a canine infection. More recently extensive studies of skin sensitivity to histoplasmin, tuberculin and coccidioidin have been made by Tucker⁴⁻⁷ on "non white" patients admitted to the Colon Hospital, Cristobal, C. Z. Nearly two-fifths of the patients tested had positive reactions to histoplasmin. Whereas only 1.7 percent of 230 children in their first decade were histoplasmin positive, there was an abrupt rise to 35 percent positivity during the second decade and to a plateau of about 55 percent positivity during the next four decades. Of 77 patients who were histoplasmin positive but tuberculin negative, 15.6 percent had one or more foci of pulmonary calcification. A slightly greater incidence of pulmonary calcification was noted on roentgenograms of patients who reacted positively to both histoplasmin and tuberculin. In spite of these indications of rather widespread contact with *Histoplasma capsulatum*, none of these patients showed any mycologic, serologic, or pathologic evidence of active histoplasmosis.

Shortly after Tucker's studies were completed a 4 month old Negro infant died at Gorgas Hospital of disseminated histoplasmosis.⁸ Organisms were identified in the lung, liver, spleen, and lymph nodes. This case, then, represented the first human infection by *H. capsulatum* to be recognized in Panama since Darling's original cases 45 years earlier. Since the publication of Draheim's case there have been two additional deaths from histoplasmosis in Panama. Although neither has as yet been reported in the literature, one (AFIP Acc. 584154) has been reviewed and the diagnosis confirmed at the Armed Forces Institute of Pathology.

¹ From Armed Forces Institute of Pathology, Washington, D. C.

These recent cases did little to solve the enigma of a disease considered extremely rare by clinicians and pathologists in Panama but actually very prevalent in that area when judged by skin sensitivity tests. Moreover the recent cases served to accentuate the mysterious disappearance of the disease for so many years. Tucker speculated that because superficial fungus infections are common in Panama the high incidence of histoplasmin reactors might be attributable to nonspecific or cross reactions. Further evidence that the epidemiologic situation in Panama might not be entirely analagous to that reported from the United States was the lack of any doubtful or positive histoplasmin reactors among 691 cattle even when the concentration of antigen was increased to 1:5. Furcolow and Ruhe in Kansas had found a high incidence of histoplasmin positive cattle and therefore deduced that both cattle and men are probably infected from the same outside source.

Although the true state of affairs regarding histoplasmosis in Panama must await further developments the suspicion that contact with the causative fungus is and has been rather wide spread in Panama is given further support by two recent discoveries.

The first evidence comes from Fitzsimons Army Hospital in Denver, Colo. Puckett and his colleagues at that hospital have found organisms morphologically compatible with *H. capsulatum* in about 40 pulmonary lesions following surgical resection. The first 30 have been reported recently. Of especial interest is the fact that 13 of these 30 patients had resided in Panama for periods of from two to five years before their pulmonary lesions were discovered. In at least four of these cases there was roentgenologic evidence that the lesion had developed while the patient resided in Panama. Puckett's cases have been filed at the Armed Forces Institute of Pathology.

The second evidence and the primary reason for this article was the accidental discovery of a single healing pulmonary granuloma due to histoplasma entirely similar to those in Puckett's series in a Panamanian child who had died in 1931. This case had been included inadvertently in a group selected from the files of the Armed Forces Institute of Pathology for another study. The autopsy had been performed on 27 June 1931 at Colon Hospital. This 4 year old native born child was admitted to the hospital with a fever of 105° F. in a delirious semicomatose state and died 96 hours later. Malarial parasites were found in his blood smears before death and in smears prepared from the 220-gram spleen and the bone marrow at autopsy.

Microscopic study of the organs revealed no evidence of disseminated histoplasmosis. One section of lung contained a single

discrete pulmonary granuloma, 0.7 cm in diameter. This lesion had the typical appearance of a "tuberculoma" with no active inflammatory reaction (fig 1). Because this lesion came to my attention at about the same time I was reviewing Puckett's cases the striking similarity was noted and special fungus stains were

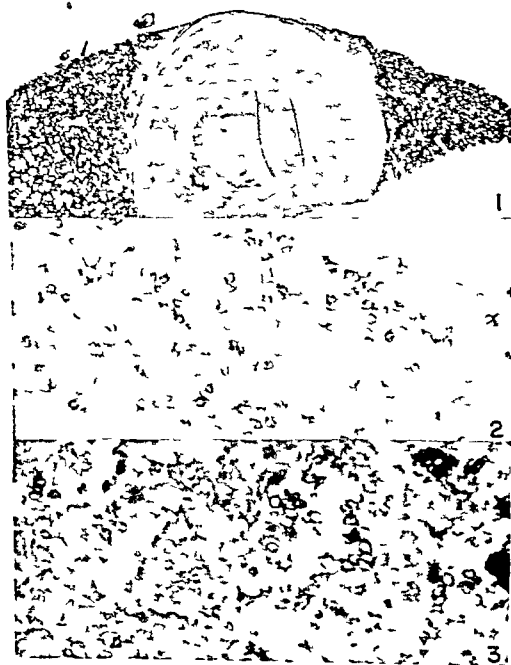


Figure 1. Discrete well-encapsulated granuloma of lung (Hematoxylin and eosin stain, $\times 11\frac{1}{2}$). Figure 2. Histoplasma within the central necrotic area of the granuloma shown in fig 1 (Gridley fungus stain, oil immersion, 990). Figure 3. Another field from the same lesion showing histoplasma (Gridley fungus stain, oil immersion, $\times 1210$).

prepared The reward was the finding of a central focus heavily laden with bodies having the same size shape and staining reactions as those in Puckett's series (figs 2 and 3) This lesion was shown in consultation to Doctors C H Binford and C W Emmons who agreed with the diagnosis of localized pulmonary histoplasmosis Lesions of this sort may be responsible in part for the occurrence of pulmonary calcification in tuberculin negative histoplasmin positive persons

This case partially fills the long gap from 1906 to 1945 when no new cases of histoplasmosis were reported from Panama Together with the epidemiologic studies of Tucker and the pathologic reports from Forsee Puckett and Hagman's surgical patients who had been exposed in Panama where their lesions were discovered the case herein reported suggests that histoplasmosis has been and still is prevalent in Panama

SUMMARY

The recent demonstration of histoplasma by use of special fungus stains in a pulmonary granuloma of a native Panamanian child who died at Colon Hospital in 1931 provides a missing link in the history of histoplasmosis in Panama This disease had not been reported in that country for almost 40 years following Darling's original description of the organism

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PREVENTION OF COMBAT FATIGUE IN CIVILIANS

There is one aspect of combat fatigue familiar from World War II that has important implications for civil defense. Combat fatigue was not entirely a problem within a given person as was shown by the relative incidence of casualties in different units subject to comparable stress. It was repeatedly found that certain units within a battalion regiment or division ran consistently higher or lower casualty rates than their neighboring units. As the distribution of vulnerable persons was similar in all organizations the disproportionate incidence of psychiatric breakdown could not be attributed to disparities in that respect. The only tenable explanation was that the difference was owing to the influence of the group or combat unit which could offer realistic protection against external fear. The soldier did not fight alone. He had his buddies by him who shared his dangers and privations and whom he knew would help him if he were disabled. The more confidence he had in his platoon or company the less fearful was the battle situation. But in civilian population this sort of support is more difficult to achieve. To bring it about people must be organized into close units and trained to meet disaster. Unless a close working together of the smallest units in a community is fostered the feeling of helpless isolation and inability to cope with the situation will add to the already heavy emotional burden all must bear. This in turn will increase the incidence of mental breakdown.

—EDWARD C. ADAMS, M.D.
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IODINE METABOLISM AND ITS RELATION TO THE THYROID HORMONE

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BECAUSE thyroid function is so intimately associated with iodine metabolism our understanding of thyroid diseases presupposes knowledge of the physiology of iodine

We know now of course that a deficiency of iodine results in the development of simple colloid goiter. In ancient times low ever ashes of seaweed and sponge were used in treatment of goiter. Coindet first used iodine itself therapeutically after the element was discovered in 1812 incident to a search for gunpowder for Napoleon's armies and Chatin² in the mid nineteenth century scientifically correlated iodine-deficient geographic areas with the incidence of goiter. In this country Marine first established the value of iodine in goiter prevention in his classic studies on the school children of Akron Ohio. Since then the addition of iodine to food (usually as 1:10,000 of table salt) has reduced greatly the incidence of goiter in endemic districts.

IODINE DEFICIENCY

Iodine deficiency may result from an absolute lack of the mineral in ingested food and water or from a relative insufficiency during periods of increased metabolic demand such as puberty pregnancy and lactation. In addition it seems probable that certain microorganisms in the digestive tract may reduce the iodine absorption from food as was demonstrated by McCarrison and Madhava who correlated the incidence of goiter with that of infected drinking water in India. It is well known moreover that certain compounds notably the thiocyanates inhibit iodine uptake in the thyroid gland. Presumably one or more of these substances is the active factor in foods such as raw cabbage turnip kohlrabi and rutabaga which enhance the goitrogenic effect of an iodine-deficient diet. These vegetables are known to be high in cyanogen content which presumably converts to cyanides and cyanates.

The goitrogens (sulfonamides thiourea derivatives and certain leafy vegetables) conceivably may be responsible for colloid goiter in regions outside of the goiter belt. For instance in

From Naval R Off T g Co p U ty I P yls in Phil
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Derbyshire, England, endemic goiter may be due to dietary factors because the water in that region contains an adequate amount of iodine and the introduction of iodized salt did not reduce the goiter incidence.⁴

Wyngaarden and associates⁷ reported that iodide collection by the thyroid gland is inhibited not only by the thiocyanate ion but also by perchlorate, chlorate, hypochlorite, periodate, iodate, biiodate, and nitrate. In fact, perchlorates were 10 times as potent as thiocyanates in discharging iodides already accumulated in the thyroid gland.

IODINE UTILIZATION

The thyroid gland has a remarkable avidity for iodine. Although thyroid tissue usually constitutes only 0.05 percent of the body weight, it contains about 20 percent of the total iodine, the rest being found mainly in the skeletal muscles, pituitary gland, and ovaries. The thyroid gland concentrates iodine to about 250 times the level in blood plasma and 80 times that of any other organ. Gastric juice concentrates iodine to levels 40 times and salivary juice to levels 30 times those of plasma, but their concentrations parallel those of the plasma while those of the thyroid gland continue to rise even when the blood levels fall. This gastric and salivary concentration is of embryological interest because the thyroid gland also originates from the foregut.

Eighteen percent of the iodine fed experimental animals can be recovered in the thyroid gland, and when radioiodine is administered, the unsaturated gland becomes saturated with inorganic iodide in five to 10 minutes. The daily iodine requirement of man is about 100 μg but actually more than twice that amount is used because the thyroid gland constantly prepares fresh hormone for future use. The average normal human thyroid contains a total of from 10 to 15 mg of iodine, which represents about 2 mg per gram of dried tissue. This compares with the normal blood iodine concentration of from 4.0 to 7.5 μg per 100 cc of serum, which totals less than 1 mg for the entire circulation.⁸ The thyroid gland is able to "trap" sufficient iodine from this minute blood concentration by virtue of its blood flow of 4 ml per gram of tissue per minute, which is richer than any tissue other than lung, and it is estimated that it can extract from about 27 liters of blood daily.⁹ The mechanism of iodine concentration or trapping may not be entirely by simple diffusion but rather by adsorption on protein.¹⁰

Three new developments have increased our knowledge of iodine metabolism: (1) metabolic studies with the radioactive isotopes of iodine, (2) accurate methods for excretion, identification, and chemical determination of iodine compounds, and

pounds in biologicals (such as the Chaney method which permits determination of as little as 0.005 μg of iodine in analysis specimens as small as 1 or 2 ml of plasma or serum) and (3) pharmacological agents which allow biologic dissection of thyroid function in living subjects by interfering with specific steps in thyroid hormone manufacture

Radioiodine (I^{131}) is an excellent tracer substance with its convenient half life of eight days and its near freedom from inert iodine which makes possible its oral or intravenous administration without an appreciable increase in the total iodine content of the body. However for physiologic study the usual therapeutic doses cannot be used because the decreased thyroid activity upsets the equilibrium under study and thyroglobulin may be liberated abnormally from the gland causing an elevation of the serum iodine levels. For these reasons and also to avoid any possible carcinogenic effect by radioiodine, doses of less than 100 microcuries are advocated for physiologic studies. Fortunately sensitive recorders such as the scintillation counter permit accurate measurements after small tracer doses. For the actual amounts of iodine being metabolized chemical methods must be used. A fairly clear picture of the metabolic steps is obtained from the combination of these techniques.

Regardless of the form in which iodine is ingested it is absorbed as inorganic iodide partly in the stomach but mostly in the intestine. It was demonstrated by Leblond and Sée that injection of iodate diiodotyrosine or thyroxin is followed by no iodine uptake for some time until those forms are broken down to iodides. Albert and Keating¹² showed that in tracing I^{131} after its absorption through the gastrointestinal tract there is radioactivity over the liver for a period of several hours presumably due to the presence of radioiodine in the bile and hepatic lymph. When I^{131} is given intravenously radioactivity concentration does not occur over the liver. They also gave radioactive diiodotyrosine to myxedematous human volunteers and found that it was practically all converted to iodide and rapidly excreted in the urine. Albert administered radiothyroxin and found that I^{131} accumulated in the thyroid gland at a slow constant rate independent of the plasma concentration indicating that the thyroid I^{131} must have come from the radioiodide liberated by catabolism of thyroxin rather than that administered. Wallace and Brodie in 1937 showed that administered iodides behaved exactly like chlorides and thiocyanates being found almost entirely in the extracellular fluids throughout the body except for the chloride concentration in the brain and the iodide in the thyroid gland. They concluded that any selective chemical or physical relationship of iodide to tissue cells was improbable.

The ion is excluded from most cells but freely traverses the erythrocyte membrane, reaching a concentration in the red cell fluid about two thirds that of the plasma. Iodide also can be found in cerebrospinal, ascitic, and edema fluids. It traverses the placenta to be stored in the fetal thyroid gland and is secreted in the milk during lactation. Very small amounts of iodide are lost in the sweat, feces, and possibly expired air. In euthyroid persons this loss probably totals less than $6 \mu\text{g}$ daily.¹⁶

RENAL EXCRETION

Most of the iodide is either trapped in the thyroid gland or excreted by the kidney. Some of the administered iodide passes into the stomach and small intestine but most of this is reabsorbed, so that little is excreted by the colon. In the kidney, iodide is filtered through the glomeruli and then about three fourths of it is reabsorbed by the tubules. Because of this renal competition with the thyroid for iodine, renal impairment theoretically should lessen the chance of iodine deficiency and goiter. Based on radioiodine studies by Myant and associates,¹⁷ the thyroid and renal removal of I^{131} differs from that of other tissues because both clear a constant volume of plasma of radioiodine each minute and their rates of uptake or excretion vary with the plasma levels, whereas the loss to the tissue decreases as equilibrium is approached. The renal clearance of iodine normally does not change, and this constancy of excretion results in a negative iodine balance when the intake is insufficient for metabolic demands. The renal clearance of administered I^{131} has been computed to be about 32 ml per minute in both euthyroid and hyperthyroid patients, which, allowing for the amount contained in the red blood cells, totals about 37 ml of blood per minute. Because the renal blood flow averages 1,200 ml of blood per minute, this amounts to about a three percent efficiency of removal. The clearance is depressed in renal disease, myxedema, and after experimental hypophysectomy.¹⁸

The average iodine uptake by the normal thyroid gland has been calculated to average $10 \mu\text{g}$ per hour when I^{131} is given.¹⁹ When small amounts of iodides are added, the total iodine uptake increases, but larger amounts inhibit its organic binding in the thyroid gland. When not bound, the iodine continues to circulate in the blood in its inorganic form, which can be excreted by the kidney. This has been suggested by Wolff and Chaikoff²⁰ as an explanation of why there is occasional exacerbation of the hyperthyroid state of patients receiving iodide therapy, because an insufficiently high blood level will no longer inhibit the gland activity.

Once iodides are trapped and concentrated in the thyroid gland, enzymatic action rapidly combines them with tyrosine to form

the thyroid hormone. First the iodides are oxidized to iodine. This takes place within a protein molecule and is the step which is blocked by the thiouracil and thiourea compounds, sulfonamides, para aminosalicylic acid and para aminobenzoic acid. Then the amino acid tyrosine is progressively combined with iodine to form moniodotyrosine and diiodotyrosine. Two molecules of diiodotyrosine then couple by oxidation forming thyroxine in the cells lining the follicles. Thyroxine does not remain free but combines with available proteins to form thyroglobulin and this substance is stored in the colloid. This is the storage form of the hormone and is never found normally in the circulation.

When the active hormone is required, the tightly bound thyroglobulin is hydrolyzed to the smaller thyroxine molecule and released to the circulation by simple diffusion in a form loosely bound to the serum albumin, alpha globulin and beta globulin (the concentration gradient of thyroid gland to plasma being about 100 to 1). Thus iodine is present in the blood stream only as inorganic iodide, thyroxine and diiodotyrosine in small amounts. In comparison the thyroid gland iodine is in protein bound form as perhaps 60 percent diiodotyrosine, 15 to 20 percent moniodotyrosine and lesser amounts of iodide, moniodohistidine and elemental iodine, these ratios changing somewhat with iodine administration.^{1, 2}

TRIIODOTHYRONINE

Much experimental work now concerns the evaluation of triiodothyronine, a substance which apparently lies between tyrosine and thyroxine and in its levo form causes a sharp rise in metabolic activity of laboratory animals. It may represent an intermediate step in thyroxine production or possibly the end product of thyroxine breakdown in tissue metabolism. Some authorities even conjecture that triiodothyronine may be released into the circulation in thyrotoxicosis, causing a true qualitative abnormality of thyroid hormone activity. Asper and associates reported that preliminary studies on three patients with myxedema showed that 1 triiodothyronine produces an immediate metabolic effect five to 10 times that of equivalent amounts of 1 thyroxine. They conclude that it may represent the functional constituent of the thyroid hormone.

The reason blood serum and other proteins are not iodinated is due to the fact that iodide must be oxidized to elemental iodine before it is available for iodination of tyrosine and only the thyroid gland can effect this oxidation. Thus, no amount of iodine given to a thyroidless person will result in thyroid hormone production but any indifferent protein can be iodinated artificially in vitro and this will relieve his deficiency. It is of interest,

however, that when iodides are given to patients with myxedema, a rise occurs in the protein bound iodine in the serum, presumably from a noncalorigenic organic compound of iodine which is not formed in the thyroid gland ¹⁶

Albert and Keating's¹² conclusions from radioactive thyroxin administration were that the dietary iodine is by far the greater source in thyroid hormone synthesis. It has been demonstrated that thyroxin itself is not reaccumulated and re used by the thyroid gland, and only about 20 percent of the iodine freed from catabolism of tissue thyroxin is trapped by the thyroid gland, the bulk of it being excreted in the urine as iodide and small amounts as thyroxin and possibly diiodotyrosine. In addition, certain amounts of the hormone are excreted in the feces in the protein bound form. Thus, the economy of iodine conservation from the thyroid hormone is poor, and continued formation in the gland is necessary for normal metabolism.

EFFECTS OF THYROID HORMONE

The active thyroid hormone circulates in its protein bound form in the blood plasma and has the function of a catalyst to increase the oxidative processes of body tissue, probably by direct action on the cells. A single administered dose will result in a rise in the basal metabolic rate in a few hours, reaching a maximum effect in a few days and lasting several weeks. The average human being possesses a total of about 14 mg of thyroxin at a given time, and it is estimated that about 0.3 mg is manufactured and delivered daily. One milligram of thyroxin results in a rise of about 2.5 percent in the human metabolic rate.

The metabolic effects of the thyroid hormone are widespread and vital. As a result of the calorigenic effect, cellular oxygen consumption is increased, with the interesting exceptions of cancer tissue and the thyroid cells themselves. Vitamin utilization and requirements are generally increased from thyroid activity; vitamin A deficiency may occur in hyperthyroidism from increased utilization and also in hypothyroidism from ineffective conversion from carotene. The thyroid hormone also enhances protein catabolism and myxedema is characterized by the accumulation of extracellular fluid rich in hyaluronic acid, containing a mucoprotein. Creatine excretion increases with thyroid activity, presumably because the hormone is essential for muscle cells to synthesize creatine phosphate from creatine. The thyroid hormone increases the absorption of carbohydrates and enhances the processes of both glycogenolysis and gluconeogenesis. In lipid metabolism, serum cholesterol levels rise with hypothyroidism and fall with hyperthyroidism, the esters remaining in unchanged ratio because the total body cholesterol and the amount

excreted both remain unchanged probably this represents merely shift to and from the blood stream Both diuresis and excessive calcium ion excretion occur in response to the thyroid hormone Its many other effects include growth stimulation increased nerve irritability and mental development and improved cardiac function It has also been reported² that the ratio of bound magnesium is increased in the serum of hyperthyroid dogs and human beings and decreased in their hypothyroid state Although no clinical application is immediately apparent some metabolic connection may exist between this ion and thyroid function

ENZYMIC RELATIONS

The enzymic processes involved in thyroid hormone synthesis and utilization are a subject of much biochemical research and controversy It is generally agreed that peroxidase is the enzyme essential for the iodination of tyrosine and formation of thyroxin from diiodotyrosine In support of this it is known that thiourea and thiouracil inhibit peroxidase action To demonstrate this Heston² incubated milk to which were added xanthine and radioiodine resulting in thyroxin containing the I¹ The reaction was explained as one in which the xanthine oxidase in milk caused xanthine to release hydrogen peroxide which in the presence of milk peroxidase oxidized the iodide to iodine then combined with tyrosine groups to form diiodotyrosine which coupled to create thyroxin When thiouracil was added before incubation thyroxin was not formed

The mechanism of thyroglobulin conversion to thyroxin before release probably involves a proteolytic thyroglobulinase with an intermediary process concerned with the deiodination of diiodotyrosine by desiodase during which liberated iodide is returned to the iodide pool within the gland for reincorporation into thyroglobulin It has been postulated that the large thyroglobulin molecules can pass only into the follicles but that along with them pass the small molecules of proteases which split the protein into smaller polypeptides which can escape Other enzymes which may be involved in this stage are a proteolytic enzyme which frees tyrosine from hemoglobin an alkaline glycerophosphatase and a substance with mucolytic activity

In 1950 Drabkin reported that in rats who had their thyroid glands surgically removed or who had been treated with thiouracil there was marked reduction in the tissue concentration (especially in skeletal muscle) and total body content of cytochrome C furthermore in rats made hyperthyroid by thyroxin administration there was a marked increase in cytochrome C He hypothesized that this enzyme was the regulatory agent of tissue oxygen consumption

Other experimental work²¹ has shown that cytochrome oxidase, cytochrome C, succinoxidase, and amino acid oxidase are increased in the liver of animals made hyperthyroid and decreased in those hypothyroid. Xanthine oxidase and arginase are occasionally increased by thyroxin administration. Lactic dehydrogenase is increased in hypothyroidism. Acid phosphatase is decreased and alkaline phosphatase increased in hypothyroidism, and the latter is decreased in hyperthyroidism. It is concluded that thyroid hormone probably causes a release of multiple co-enzymes, protein carriers, and other substances which are needed in the transfer of energy. The enzymic effects are apparent on practically all the organs of the body, in cellular metabolism, tissue maturation, and the metabolism of proteins, carbohydrates, fats, salt, and water.

HORMONE SYNTHESIS AND RELEASE

Thyroid hormone synthesis and secretion are mainly under the endocrine control of the thyroid stimulating hormone (TSH, thyrotropin) elaborated probably by the basophilic cells of the anterior lobe of the pituitary gland. The hormone is involved in all steps of thyroid hormone synthesis and release. For the latter action, TSH activates the enzymatic proteolysis of thyroglobulin. Thus, the "iodine trap" of I^{131} in the thyroid gland, compared with the plasma iodine concentration, normally occurs in a ratio of 250:1 and falls to 25:1 in hypophysectomized animals, being partly restored to its normal ratio by administration of thyrotropin. However, it does not appear to be the only mechanism of iodine binding. Albert²⁴ showed that after hypophysectomy thyroid glands still will bind 95 percent of administered I^{131} , though the process is much slower than normal.

Iodine in pharmacological dosage depresses thyroxin synthesis both through its inhibiting effect on thyrotropin release and direct effect on the thyroid gland, presumably by depressing the proteolytic enzymes. The serum iodide levels necessary for inhibition of organic binding are quantitative and are decreased in hyperthyroidism. In accordance with the general rule of endocrinological control, an excess of circulating thyroid hormone also decreases TSH release from the pituitary. These effects probably are indirect through the hypothalamus which also may be influenced by higher centers.

Certain physiological factors also are of interest in the control of the thyroid hormone. The rate of tissue demand for thyroxin is increased in puberty and pregnancy, but decreased in old age. Most forms of stress do not affect the thyroid hormone demand but exposure to cold does result in the need for more hormone to sustain metabolism.

Once goiter is established iodine is of less benefit but a hyperplastic disorder may be converted into a more benign colloid form and occasionally a single nodule may subside completely. This action results from the iodine suppression of TSH and also some direct thyroid action. However iodine in excess may result in hyperactivity of simple goiter and if associated with a goitrogenic diet may cause hyperthyroidism. Thus it is apparent why the control of thyrotoxicosis by Lugol's solution is such a delicate balance: the aim is to give enough to cause thyroid suppression and yet not enough to aggravate the condition.

TESTS OF THYROID FUNCTION

The determination of the organic plasma iodine more commonly referred to as the protein bound iodine (PBI) is a useful test of thyroid gland function although its performance is complicated, time-consuming and prone to numerous errors due to faulty technic or preparation of the patient. Hydd and co workers² advocate determination of the serum precipitable iodine (SPI) level as the most accurate index of thyroid function. The organic fraction in the plasma or serum is most representative of the thyroid state because the inorganic iodide fraction ordinarily is negligible as is the amount in the red blood cells. The normal protein bound iodine (PBI) is from 4.0 to 7.5 μg per 100 cc of serum or plasma; patients with hypothyroidism usually have values from 1 to 2.5 μg percent and in hyperthyroidism levels from 20 to 30 μg percent may be found. However nonrepresentative low readings may result from exposure to cold and possibly from mercurial diuretics shortly after administration and elevated levels may be found normally during the first year of life and during pregnancy especially within the first 16 weeks.

The most common source of error is the presence of iodine compounds elsewhere in the body of the individual tested. Authorities differ as to the time over which distorting effects may be exerted but probably the iodine in the dyes used in myelograms, bronchograms and the visualization of sinus tracts may be present for as long as two years; that in cholecystograms for as long as six months; and that in urograms for at least several days. Moreover administration of Lugol's solution may cause an elevation of the blood iodine level for one month or longer. Even tincture of iodine on the skin or ingested sea food or certain vitamin preparations may give false elevations suggesting hyperthyroidism.

The use of tracer doses of radioactive iodine has afforded another useful and probably most definitive test of thyroid function. As has been stated previously iodine so tagged can

be traced by radioactivity counters to determine its eventual concentration in the thyroid tissue. With the scintillation head it is possible to use doses as small as 1 microcurie and still to scan very minute areas to measure uptake. Both beta and gamma rays are emitted. The beta rays cause tissue ionization and produce the therapeutic effect. The few gamma rays permit counter tracing but cause little biologic effect. For routine diagnosis most authorities consider that the 24 hour uptake measurement is best. The euthyroid range is from 10 to 15 percent, the hyperthyroid level, from 30 to 95 percent and the hypothyroid range, below 15 percent. However, euthyroid patients occasionally may show uptake as high as 50 percent, and the noted overlaps may cause confusion in the unusual case. To solve this problem, the plasma clearance test may be used with the I^{131} content measured in blood plasma every 30 minutes for two hours. This test is particularly valuable in differentiating hyperthyroidism from the occasional case of thyroid carcinoma with high uptake because the latter will take up I^{131} but will not retain it as will the true hyperthyroid. By the exposure of x ray film to the radioactive uptake area, the "thyroid autograph" may be obtained for possible use in visualizing the type and localization of abnormality.

Drummy²² evaluated the accuracy of radioactive iodine studies in detecting thyroid dysfunction in over 2,000 patients who were followed more than three and one half years. He found an excellent clinical correlation in that 93 percent of euthyroids showed from 15 to 50 percent uptake, no hypothyroids had more than a 15 percent uptake, and 96 percent of hyperthyroids had an uptake greater than 50 percent. He reported, moreover, that the uptake usually was normal when pituitary insufficiency was present. The uptake was increased artificially for from one to eight weeks after discontinuing antithyroid drugs, and the uptake was reduced to below 15 percent in many cases for as long as six months after cholecystography, two weeks after giving desiccated thyroid and one week after intravenous pyelography or administration of Lugol's solution. Recent reports² also suggest that the results in tracer studies may not be representative in some cases of toxic nodular goiter.

URINE EXCRETION TESTS

The urinary excretion of radioiodine has been shown to be an accurate index of the thyroid state, because it is known that thyroidectomized patients excrete all administered I^{131} in the urine. Skanse²³ has described such an I^{131} tolerance test which he considers a more sensitive test than direct quantitative uptake measurement. One hundred and ten normal euthyroid patients

of TSH and may be given with antithyroid drugs when it is urgent to put an overactive gland at rest such as in rapidly progressing exophthalmos. As has been stated previously, iodides will cause a rapid decrease in the rate of thyroid hormone synthesis presumably through TSH inhibition and also direct action on the thyroid hormone enzymes.

Thiocyanate drugs inhibit most of the thyroid's ability to concentrate the iodide ion except in massive doses and will cause reduced hormone activity. The gland enlargement which results in some cases usually can be overcome by administration of iodides concurrently. Many drugs are known to prevent the iodination of tyrosine and hormone synthesis even though iodides still are concentrated in the gland; these include the thioamide series, para-aminobenzoic acid, sulfonamides, and the aniline drugs. Potassium perchlorate has given promising results in preliminary tests. Thiouracil was one of the first drugs of this group and is perhaps 70 percent effective in treating a small gland in young patients. However, some toxic effects have been noted on blood and liver. The drug does not retard exophthalmos and is thought by some to be carcinogenic. The newer drugs of this group, iturmil (sodium 5-iodo-2-thiouracil) and tapazole (methimazole) are frequently used to render a thyrotoxic patient euthyroid prior to surgical intervention or I^{131} treatment.

It is now generally agreed that hyperthyroid patients are best treated in most instances by I^{131} which after a six to eight week lag is almost always effective in curing them of diffuse thyroid hyperplasia. Disadvantages in the use of I^{131} are the transient aggravation of thyrotoxicosis, the creation of hypothyroidism in perhaps 10 percent of the patients, and the failure to reverse eye signs. Probably carcinogenesis is not a real concern. It is not generally used on patients younger than 45 years, especially during pregnancy, or in cases of suspected thyroid carcinoma, but it is recommended in most instances when these conditions do not apply. When surgical thyroidectomy has been performed and metastases of carcinoma are suspected or known, thyrotropin may be given to mobilize these areas and thus permit augmented I^{131} uptake and therapeutic effect.

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TRAUMATIC DISSECTING ANEURYSMS OF THE THORACIC AORTA

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TRAUMA as a cause of cardiovascular lesions has long been recognized and is discussed in standard textbooks. One reaches the conclusion, however, after reading these discourses that the authors are not absolutely convinced of the importance of trauma and that many tend to pass over the topic lightly without making any definite conclusions.

Injuries from mechanical violence and their complications are of increasing importance and concern both in warfare and in civilian life. Our knowledge and understanding of the physiology and pathology of injuries gained from World War II and the Korean battle front have been greatly increased. This growing understanding is currently reflected in the increased emphasis, in the recent medical literature, placed on mechanical trauma to the heart and great vessels. In this connection traumatic aneurysms of the aorta are too often not recognized or even considered as a possibility before the patient comes to autopsy. This recognition of traumatic aneurysm is important both from a surgical standpoint and from the medicolegal causal relationship point of view.

Rice and Wittstruck¹ reported an aneurysm in a pregnant young woman of the first portion of the aorta caused by an automobile collision in which the patient was struck violently on the upper chest. Stryker described an aneurysm in an 18 year old girl who died six months after an automobile accident in which her chest had been injured. Her condition was complicated by the development of subacute bacterial endocarditis in the aneurysm.

Shennan contributed to the literature three cases of aneurysm in which the lesions were apparently produced by unusual athletic exertion. These were in males aged 13, 23, 30 years. Stern cited a case reported by Aschoff and a case of traumatic aneurysm from the records of the Supreme Court of Idaho. A case of dissecting aneurysm following an automobile accident ruptured into the left pleural cavity 16 days after the traumatic episode.

F. M. Edwards & W. Sperry Hospital, Lansing, Michigan

This article presents three patients with fatal dissecting aneurysm of the ascending aorta following relatively minor traumatic episodes

CASE REPORTS

Case 1 A 19 year old woman was first seen by a physician at her home after she had fainted in a restaurant. On the night prior to the fainting episode she had attended an outdoor square dance. After she returned home from the dance she commented that she had "never exercised or worked so hard in my life."

She was unconscious long enough to be carried into the lounge. After she regained consciousness she relapsed each time she attempted to sit up. At this time she complained of a headache which radiated from beneath the lower jaw upward into the upper jaw and head. She became nauseated and vomited six times.

One of three siblings, her past history showed an episode of diarrhea shortly after birth. She had measles at six years of age and scarlet fever at eight years. She had had no operations and had never been hospitalized until the present illness. The family history was entirely negative. Numerous physical examinations of the patient throughout her life revealed no positive findings except for a concavity of the sternum. In the year prior to the illness she had fainted on two occasions in church. In both of these episodes unconsciousness was momentary.

The physical examination when the patient was first seen showed a well developed, well nourished white female. The blood pressure in the right arm was 78/40, in the left arm, 118/70. The sternum was concave. There was a prolonged diastolic murmur at the left of the sternum, loudest in the third and fourth inter spaces, but heard also in the second interspace and at the apex. There were no other contributory findings.

Three days later her mother called the physician, stating that the patient felt that she "could feel something happening" in her chest. She was then hospitalized for a period of 10 days for diagnostic procedures.

At this time the blood pressure in the right arm was 60 to 78/40 in the left arm 100/30. Her temperature was 98.6° F, pulse, 100 respirations 20 per minute. There was a coarse heavy thrill palpable in the patient's neck and over the entire chest wall, anteriorly and posteriorly. A harsh, grating murmur was heard loudest to the left of the sternal border. This murmur was so loud that the first impression was that it must be systolic, but correlation with the apical thrust and pulsations of the neck vessels showed it to be entirely diastolic. There was



Figure 1 (case 1) The peritoneal sac is distended with blood and blood clot.

no sign of congestive failure in the neck veins, liver or extremities. She was somewhat more comfortable in a sitting position but could lie down without difficulty.

An orthodiagram was made and the patient was fluoroscoped but the findings were difficult to evaluate because of the marked



Figure 2 (case 1) Distal portion of the left ventricle and the distal portion of the aorta. The arrow points to the distal portion.

sternal depression displacing the heart to the left. No definite cardiac abnormalities were noted. There were rather prominent pulsations of the aortic knob. Phonocardiography proved the murmur to be in diastole.

At this time a tentative diagnosis of a perforated or ruptured aortic valve leaflet was proposed. Subacute bacterial endocarditis was suggested as a causative agent. Numerous blood cultures were negative, however, and all laboratory findings were within normal limits. There was no temperature rise. Sixteen days following the onset of the illness she died suddenly.



Figure 3 (case 1) Photomicrograph of the aortic media at the dissection site. The media is heavily infiltrated with erythrocytes, neutrophils, and small round cells (Hematoxylin-eosin stain $\times 100$).

Significant findings at necropsy were limited to the heart and ascending aorta. The pericardial sac was markedly distended with more than 1,000 cc of blood clot (fig 1). The heart was of normal shape and weighed 325 grams. The epicardial surface was smooth with a slight increase in subepicardial fat. The myocardium was of normal consistency and color. The vessels showed no evidence of arteriosclerosis. Auricular and ventricular chambers showed no thrombi. The valve leaflets presented the usual appearance. No scarring or calcification was found.

About 1.5 cm distal to the base of the aortic valve leaflets, on the posterior surface of the aorta, the intima and innermost portions of the media were completely transected by a slit 1.5 cm in width (fig 2). From this slit the media had been dissected downward for a distance of 1.5 cm. to a small slitlike aperture, 1 cm in width, which perforated the external portion of the media.

and the adventitia on the right posterolateral aspect of the aorta. This aperture communicated with the pericardial sac and was entirely within the confines of the pericardial sac. There was no gross change of the aortic intima elsewhere.

Microscopic examination showed the following. The aortic intima was in good condition. At one end of the section the media was of usual appearance except for scattered polymorphonucleocytes and round cells. The other end showed separation of the media at about the junction of the outer and middle thirds (fig 3). Evidence of an old hemorrhage with numerous hemosiderin-containing phagocytes was found in this area. The inner surfaces of the defect showed a layer of fibroblasts. Numerous polymorphonucleocytes and round cells were present in the media on both sides of its separation. There was no evidence of atheromatous change.

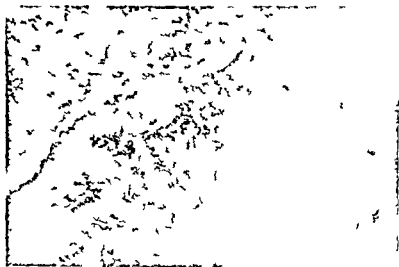


Fig. 4 (cas. 2) Photomicrograph of the dissected area filled with blood. The media shows small round cells infiltrate. (Hematoxylin-stained, $\times 100$)

Case 2. While at work a 39 year old man slipped on an icy ramp and fell backward striking the upper posterior chest. Following the accident he complained of severe pain in the back. Examination showed no evidence of fracture or other injury. The pain continued for several days and gradually subsided. On the tenth night following the accident he complained of sudden severe pain in the chest associated with dizziness. This continued until the following morning when he suddenly died.

No contributory personal or family history was obtained.

Significant necropsy findings were limited to the heart and aorta. In the ascending aorta, immediately above the aortic valve, were found several small rents of the intima. Beneath these rents there was an extensive dissecting aneurysm of the aortic wall. The structures of the media were separated by an organized blood clot. There was extensive necrosis of the aortic wall. Hemorrhage extended into the base of the heart. The pericardium was not perforated and there was no blood in the pericardial sac.

Microscopic examination (fig 4) showed no changes of the aortic intima. There was wide separation of the media at about its middle by large amounts of fresh blood. The red blood cell outlines were intact. Areas with evidence of older hemorrhage with phagocytes containing hemosiderin were found at the periphery. Numerous polymorphonucleocytes were present at the edges with small numbers scattered through the mid portion. Small numbers of leukocytes were found immediately beneath the intima. The media surrounding the hemorrhagic area showed early necrosis. There was no evidence of atheromatous change.

Case 3. A 24 year old male athlete who was an inmate of a state reformatory was admitted to the reformatory hospital because of a "cold." Upon admission his temperature was 100° F, pulse was 100 per minute, and respirations were 20 per minute. Physical examination was otherwise normal.

The patient claimed to have had rheumatic fever in childhood but this information was regarded by his physician as unreliable. He denied all other childhood diseases or venereal disease. He had never been hospitalized prior to the present illness. He was one of two siblings. There was no contributory family history. For the three years prior to his illness he had done considerable boxing. A few days prior to the onset of the illness he had participated in a boxing match.

Upon admission he was placed on bed rest and was given 50,000 units of aqueous penicillin every three hours. He had no further complaints and was apparently progressing satisfactorily. On the third day of hospitalization, while making a routine check, the attendant found the patient dead in bed.

The significant findings at autopsy were limited to the heart and aorta. The pericardial sac was markedly distended with a large amount of blood and blood clot. The myocardium and valves showed no gross changes. The coronary arteries showed no evidence of atheromatous change. Immediately above the aortic valve was a narrow tear of the intima. The media was dissected downward to an opening into the pericardial sac.

Microscopically the intima showed no changes. Throughout the media and extending into the adventitia (fig 5) was evidence of much old and recent hemorrhage. Numerous phagocytes con-



Figure 5 () Photomicrograph of aortic intima (low light band orne) and media with old and new fibrin of the media and old of hemorrhage (Hematoxylin-eosin, $\times 100$)

taining hemosiderin were present throughout. Numerous polymorphonucleocytes and round cells were noted in the media. Large areas of the surrounding media showed liquefaction necrosis. Considerable fibroblastic and angioblastic activity was apparent. There was no evidence of atheromatous change in the aorta. No evidence of syphilis was found.

DISCUSSION

Traumatic lesions of the aorta occur most frequently at a point one to two centimeters above the aortic valve, as was seen in each of the above patients. The next most common site is at the isthmus near the attachment of the ligamentum arteriosum.

Various theories have been advanced for the predilection of these regions to trauma. The generally accepted factor is the fixation of the first portion of the aorta by the fibrous union between the aorta and the pulmonary artery. Rindfleisch demonstrated bandlike thickenings of the pericardium passing from the pulmonary trunk to the aorta a short distance above the cusps. These together with the ligamentum arteriosum partially immobilize the first portion of the aorta. Thus sudden motion of the mobile portion of the vessel may cause a tear at the point of fixation.

A second factor in the development of traumatic aneurysms is an increase in the intra aortic pressure. Most observers* are of the opinion that, irrespective of the underlying cause, a sudden exertion may increase the blood pressure sufficiently to produce a break in the weakened intima, permitting blood to extravasate rapidly into the media.

A combination of the above two factors in the patients described here must be presumed. Attempts to rupture healthy aortas of rabbits or human beings experimentally have shown that they can withstand internal pressures of from 800 to 1,200 mm Hg.⁷ Thus for the establishment of the process the intima must be weakened. The simultaneous weakening of the intima by stress and the sudden increase in blood pressure is assumed to be the causative action in these patients.

In those patients with dissecting aneurysms not associated with trauma, the intima is weakened by changes of the underlying media. Focal areas of necrosis are commonly found. In some cases the muscle is first affected, while in others it is the elastic and collagenous connective tissues. The general term medio-necrosis is applied to these changes. In some cases the presence of mucoid material in cystic spaces (idiopathic cystic medio-necrosis) has been described. Medial degenerative changes of the aorta are found frequently at autopsy when no aneurysm is present. The incidence appears to be somewhat higher in hypertensives.

The cases presented here are considered to be traumatic in origin. No evidence of previous pathologic change of the aorta was found in any of the patients. The development of vascular disease or spontaneous aneurysm in a 19 or 24 year old person is most uncommon. With the finding of intimal rents and the short time elapsing before death, we must conclude that the traumatic episode was the causative factor.

Following the tear in the intima, or the formation of an intramural hematoma, the blood dissects between the outer one third and inner two thirds of the media. The dissection may proceed downward to rupture into the pericardial sac with resulting hemopericardium and cardiac tamponade as was seen in two of the patients. It may also rupture into the pleural space with hemothorax and death from exsanguination. Dissection may occur upward for a varying distance with re-entrance into the normal channel. The dissection may eventually extend the entire distance of the aorta. If rupture does not occur the false channel may eventually become endothelialized, producing the so-called "double barreled aorta," and the patient may live for many years.

even to die of some other disease. This happens to about 15 percent of these patients.

SUMMARY

In each of three patients a dissecting aneurysm followed a traumatic episode. In each patient a transverse tear of the intima just distal to the aortic valve was found. All three died two weeks with rupture into the pericardial sac and resultant cardiac tamponade; the third with hemorrhage around the base of the heart. No evidence of previous pathologic processes were found in any of the patients.

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LOBOTOMY IN TERMINAL CANCER

Lobotomy alters the attitude of the patient toward his pain. The pain of terminal cancer is compounded of the foreknowledge of death, the hopelessness that comes with an incurable disease, and the endless state of pain that comes. Therefore, lobotomy is more effective in those patients whose mental reactions to the disorder are as serious as those concerned with pain itself. Perhaps it would be better to say that lobotomy relieves the suffering of terminal cancer. When suffering is abolished, even though pain may still be perceived, an objective has been gained. And certainly, in a patient faced with death from advancing carcinoma, some degree of equanimity, if not euphoria, is well to have in order to bear the terminal stage.

—WALTER FREEMAN M D

Journal of the American Medical Association

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DETERMINATION OF THE RESIDUAL AIR VOLUME BY THE HELIUM DILUTION TECHNIC

JAMES C SYNER *Captain MC USA*

A WATERLESS basal metabolism machine and a helium meter have been used in combination to carry out residual air determinations in the pulmonary function laboratory of this hospital during the past three years. A specific procedure has been standardized and has been entirely satisfactory in simplicity, ease of operation, correlation with other recognized procedures (table 1), and accuracy of duplicate determinations (table 2). It has also proved to be of great value in the study of respiratory disease.

The use of the inert gas, helium, for the determination of pulmonary volume has been reported previously.^{1, 2} The use of the katharometer was described in detail by McMichael³ who used hydrogen as the inert gas. The present report of further experience with helium and modifications in technic developed over a three-year period outlines the procedure in detail so that the apparatus and testing method can be used with ease and accuracy.

PRINCIPLE OF THE METHOD

The physical phenomena involved in the analysis are discussed in detail elsewhere.¹⁻³ A helium meter can analyze the percent of helium by volume in wet air from 0 to 15 percent. Continuous analysis of the gas mixture is made by passing the gas sample through the instrument. The gas diffuses into the instrument, changing the resistance of a set of heated platinum wires in one arm of a Wheatstone bridge circuit. The helium gas effects an increase in the thermal conductivity of the gas around the platinum wires, thus cooling the wires and raising their resistance. A second arm of the Wheatstone bridge circuit contains a set of platinum wires sealed in an atmosphere of wet air which acts as the reference gas. A change in the resistance of the first set of wires, proportional to the percentage of helium in the sample gas, results in imbalance of the Wheatstone bridge circuit which produces a millivoltage across the indicator. The fundamental principle is the dilution by the patient of the known volume of helium in the closed circuit system during a measured

From *U. S. Army Hospital at Washington, D. C.*

TABLE I C mp r b t w m ur d nd p d t d al f st d l l g lum / no m l m w g g r o p

A th	Numbe f m	Ag gr p (y)	M ur d (cc)	P ed d ()	D ff ()
R b	12	16 19	1 300	1 160	140
	11	20 29	1 560	1 130	430
	11	31 38	1 600	1 310	290
	10	40 48	1 490	1 320	170
	8	48 55	2 150	1 475	675
	7	59 66	1 720	1 640	80
	5	71 91	1 920	1 300	620
Sy (ch r l)	6	16 19	1 109	1 202	93
	13	20 29	1 347	1 258	89
	9	31 38	1 533	1 413	120
	10	40 48	1 500	1 397	103
	8	48 58	1 979	1 640	339
	13	59 66	1 798	1 920	122
	3	71 80	1 795	1 498	297

breathing period. The dilution occurs as the helium is distributed throughout the patient's functional reserve plus tidal volumes

PROCEDURE

Preparation of apparatus The closed circuit system is arranged according to the path of air flow established by the blower in the spirometer (fig 1). If necessary a small soda lime container may be inserted on the expiratory side of the circuit. The use of large bore rubber tubing is necessary to reduce peripheral resistance. Tubing should be of maximum rigidity to prevent change in the lumen which will effect a variation in the total volume of the circuit. Tubing connections are sealed with rubber cement to prevent leaks in the system.

Accurate calibration of the spirometer bellows or bell is necessary. The method of water displacement of air utilized in this laboratory has been discussed in detail in a previous article.⁴

The volume of the closed circuit system with depressed bellows or bell must be determined by one of two methods either by dimensional calculations or by the McMichael method of measured dilution of a known volume of gas. Most investigators have found the McMichael method more convenient and accurate. Known amounts of helium are introduced into the system in sequence and meter readings obtained for each sample. From the known volume of added helium and oxygen and the helium concentration (obtained from the meter reading) the volume of the system is calculated as follows:

$$VS = \frac{100 V_{He} - (VO + V_{He})}{\%He}$$

Where VS is the volume of the system, V_{He} is the volume of helium, VO is the volume of oxygen and %He is the percent by volume of helium obtained from the helium meter.

Preparation of kymograph paper Preparation of the standard kymograph paper is illustrated in figure 2. Line 1 is the level of the styllet along the vertical with complete depression of the bellows. Line 2 is 8 cm below line 1 and is the point of reference for oxygen volume. Helium is introduced between lines 2 and 3 which is 11 cm below line 1.

First stage in determination of the residual volume A conventional respiratory tracing is obtained from a spirometer containing pure oxygen or an oxygen air mixture. During this procedure the tidal volume, expiratory reserve and inspiratory maximum are recorded separately. It is necessary to know the expiratory reserve in order to calculate the residual volume. The details for preparing the patient and obtaining the separate volumes were discussed in a previous article.⁴

TABLE 2 R p t d d i r m t w t h b l m d i f f i d y b w g p r o d u c b i l i t y f d u a l l u m

A g (y)	I l e g h (m)	W g h t (l b)	S	C l a s s i f i c a t i o n	R a n k	D i s t a n c e (c)	M u n i t (p e r c e n t)
18	180	185	M I	N r m I	1 532 1 600 1 564	-33 35 -1	2 05 2 23 01
21	167	151	M I	N r m I	1 065 1 153 1 110	-44 44 1	3 98 3 98 09
22	168	163	M I	N r m I	1 394 1 301	46 -47	3 42 3 42
35	175	148	M I	N r m I	1 201 1 331	-65 65	5 15 5 15
35	171	112	M I	Em p h y m	5 410 5 780 5 196	-52 318 -267	095 5 82 4 97
38	152	151	F m a l	S a o d	1 540 1 618	39 -39	2 41 2 41
47	185	180	M a l	Em p h y m	5 420 4 980 5 610	83 -357 273	1 55 6 75 5 1

TABLE 2 *Repeated determinations with helium on different days showing reproducibility of residual air volumes—Continued*

Age (years)	Height (cm)	Weight (lb)	Sex	Clinical status	Residual air (cc)	Deviation from mean (cc)	Mean (percent)
51	175	176	Male	Normal	1 728	-37	2 1
					1 801	37	2 1
59	165	139	Male	Emphysema moderate	2 460	11	45
					2 377	-79	3 22
					2 510	61	2 49

Introduction of oxygen into the system The closed circuit is washed out with oxygen which is bubbled through a water bottle system and then into the spirometer by way of the S-2 valve (fig. 1) All gases introduced into the system during the procedure for residual air determination must be saturated with water vapor. This meets the physical requirements of the meter which has been calibrated to wet air. Approximately 10 liters of oxygen

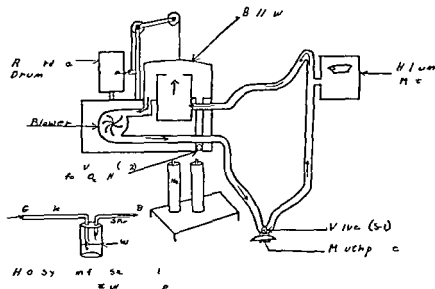


Fig. 1 Spirometer circuit for determination of the lung volume using bellows

are necessary to adequately flush nitrogen and traces of helium of any prior test from the system. The S-1 valve is opened and the bellows depressed fully to bring the styllet to the level of line 1. The S-1 valve is closed, S-2 valve opened, and oxygen introduced in sufficient volume to carry the styllet to a level with line 2. The helium meter is corrected for mechanical zero, the battery is adjusted, and electrical zero is confirmed. The spirometer blower system is turned on for three minutes to circulate the gas throughout the system. Due to heat generated from the motor driven blower system, an increase in gas volume may occur. This can be corrected at the end of the circulation period by opening the S-2 valve and allowing the excess gas to escape. The helium indicator must remain at electrical zero during this circulation period. If any millivolts are registered, further oxygen flushing is necessary.

Introduction of helium into the system Helium should be introduced into the system to bring the styllet from line 2 to line 3 (8 cm line to 11 cm line). This must be done carefully and with absolute accuracy. The blower system is then turned on and

gases allowed to circulate. After four or five minutes, the indicator needle on the helium meter will stabilize and the initial percent concentration of helium can be noted on the meter. At this point the battery zero is rechecked before the final reading of the initial helium concentration is made.

Preparation of the patient The patient is given detailed instructions of the procedure before the test is started. Using a three-way valve system and an oxygen reservoir bag (10 liters anesthesia type) connected to a tank of oxygen, the patient breathes oxygen for a period of five minutes. The expired air is blown off into the atmosphere. The oxygen breathing washes nitrogen from the lungs, and is carried out at the same time that the helium-oxygen mixture is circulating throughout the closed circuit system to stabilize the gases circulating through the helium analyzer. Then the patient is connected to the valve system by a conventional rubber mouthpiece, a noseclip is secured in place and he is told to carry on quiet, tidal respirations. Because carbon dioxide is absorbed as rapidly as it is formed, nitrogen is eliminated by the oxygen breathing, and the thermal effect of the oxygen is neutralized by rheostat adjustment of the meter, only changes in helium concentration will influence the indicator reading.

At the conclusion of oxygen breathing the patient should indicate his breathing cycle by raising the forearm on inspiration and lowering it on expiration. At the conclusion of a normal expiration the patient is told to hold his breath and shift to an adjacent rubber mouthpiece which connects the patient to the spirometer system. When the mouthpiece is secured in place the patient is told to inhale and then to continue on with normal tidal breathing. A separate valve system for oxygen breathing is used to reduce the dead space volume which complicated the five-way valve system used earlier in the study. The act of shifting from one rubber mouthpiece to an adjacent one while holding the breath has been executed with ease by all patients after they have been instructed and given several practice trials.

As the patient carries on with tidal breathing in the spirometer system, the known volume of the system will decrease because of the oxygen consumption and the transfer of helium into the patient's lung. Oxygen is introduced into the system at a rate equal to the patient's consumption. To do this accurately it is necessary to follow the respiratory tracing, watching the relation of the styllet to line 3 at the end of a normal expiration. At the end of from two to four minutes the reading of the helium meter will be constant, and the original volume of the system will be maintained by accurate oxygen replacement. This breathing is

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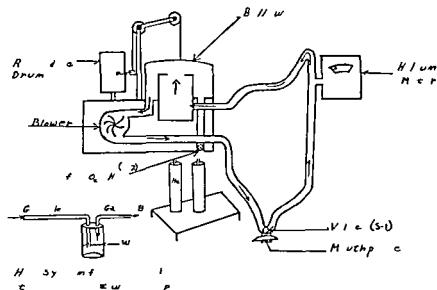


Fig. 1 Spirometer for determination of lung lung volume

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continued for six minutes in order to establish conclusively that the equilibrium of the helium gas distribution has taken place. Patients with normal pulmonary function will reach helium equilibrium in about two to three minutes whereas patients with emphysema will require a longer time in proportion to the degree of their emphysematous decompensation. The patient is removed from the spirometer system and the S-1 valve closed when the stylet is at line 3 at the end of a normal expiration thus returning the system to its original volume.

Calculations for total lung volume and residual air The McMichael method is the basic principle employed in this procedure and calculations are made as follows:

- (1) Initial concentration of helium

$$\%He_1 = \frac{V_{He} \times 100}{VA}$$

Where V_{He} is volume of helium $\%He_1$ is initial percent concentration of helium and VA is total volume of the system including gases added.

- 1 A Clearing of fractions

$$(VA) (\%He_1) = \frac{(V_{He}) (100) (VA)}{(VA)}$$

$$(VA) (\%He_1) = (V_{He}) (100)$$

- (2) Then the unknown lung volume is added to the system so the final concentration of helium is

$$\%He_f = \frac{V_{He} \times 100}{VA + VX}$$

Where $\%He_f$ is the final percent concentration of helium and VX is the unknown lung volume.

- (3) Substituting of (1) A in (2)

$$He_f = \frac{(VA) (\%He_1)}{(VA + VX)}$$

- (4) Solving for the unknown lung volume VX

$$(VA + VX) (\%He_f) = \frac{(VA) (\%He_1) (VA + VX)}{(VA + VX)}$$

$$(VA + VX) (\%He_f) = (VA) (\%He_1)$$

Factoring

$$VA (\%He_f) + VX (\%He_f) = (VA) (\%He_1)$$

$$VX (\%He_f) = (VA) (\%He_1) - VA (\%He_f)$$

$$VX (\%He_f) = VA (\%He_1) - (VA) (\%He_f)$$

$$VX = \frac{VA (\%He_1) - (VA) (\%He_f)}{\%He_f}$$

(5) Basic equation for calculation of the unknown lung volume
18

$$V_L = V_A \frac{\%He_i - \%He_f}{\%He_f}$$

VX = sum of expiratory reserve plus residual volume

To obtain residual volume, subtract the expiratory reserve from VX The total lung volume is obtained by adding the vital capacity and residual volume

The calculations made in the above equation must be corrected to body conditions, the factors of body temperature, surrounding barometric pressure, and saturation with water vapor which commonly are abbreviated BTPS

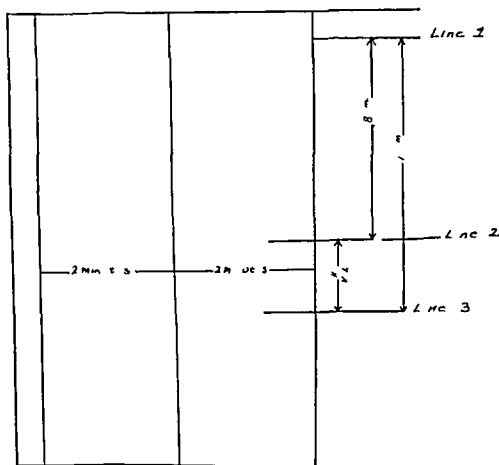


Figure 2. Mark g kymograph paper Line 1 indicates position of stylet with bellows fully depressed Eight centimeters is the volume of oxygen added and three centimeters is the volume of helium added

Other corrections involve the subtracting of the volume of air which in the valve and mouthpiece totals 36 cc Accurate cor

TABLE 3 *R* / *dual* *t* *t* *l* *l* *g* *l* *m* *m* *l* *p*

Age (yr)	$\frac{R \text{ dual } 100}{T \text{ tal lung lum } (c) (M \text{ f wo } b \text{ va })}$	G up 16 29 y (20 25 per)	Gr p 30 49 ye (25 30 p)	Gro p 50 69 ye (30 35 p a)
22	$\frac{1020 \times 100}{5870}$	18		
23	$\frac{1100}{5170} 100$	21		
27	$\frac{1763 \times 100}{6354}$	24		
30	$\frac{1900 \times 100}{6410}$		29 6	
34	$\frac{1400}{6660} 100$		21 2	
39	$\frac{1326 \times 100}{4756}$		28	
40	$\frac{1570}{5770} 100$		27 5	
47	$\frac{2365}{7665} 100$		31	
53	$\frac{1820 \times 100}{5000}$			32
57	$\frac{1888}{5283} 100$			35 5
57	$\frac{2100}{5860} 100$			36
58	$\frac{2410}{6770} 100$			35 4

TABLE 3 *Relation of residual air to total lung volume in normal persons—Continued*

Age (year)	$\frac{\text{Residual air} \times 100}{\text{Total lung volume (cc)}}$ (Mean of raw distribution)	Group 16-29 years (20-25 percent)	Group 30-49 years (25-30 percent)	Group 50-69 years (30-35 percent)
59	$\frac{1587 \times 100}{5230}$			30.4
60	$\frac{1516 \times 100}{5413}$			33.6
60	$\frac{1348 \times 100}{4509}$			29.8
60	$\frac{2650 \times 100}{8290}$			32.3
63	$\frac{1980 \times 100}{5500}$			36
72	$\frac{1651 \times 100}{4500}$			37.6

Percentages quoted from Baldwin, Cournaud, and Richardson. Mean residual air volume for each age group shown marked variation in the age groups and demonstrated that data and will demonstrate slight overlap with

rection factors for helium absorbed during testing are not available at this time, and reliable investigation of this point remains a task for the future. In an early report Meneely and Kaltreider stated that 10 cc of helium were absorbed by the body during the period of testing. In a more recent article these authors state that further experience casts doubt upon the validity of the value⁸ however, they continue to subtract 110 cc from the observed mid capacity as the amount attributable to a loss of 10 cc of helium with an average mid capacity of 2 liters. This is a very arbitrary figure and in a standardization of the testing procedure with normal values for use in a given laboratory the estimation may be unacceptable. Our data is reported with this correction.

A correction for the increase in concentration of inert gases in the lungs has been recommended by others.^{1,2} When the res

piratory quotient is approximately 0.8 the actual volume of the functional residual air is about 30 cc. less than that calculated. This is due to differences in concentration of inert gases between the lung and spirometer system. McMichael stated that the inert gaseous composition of the air in lungs would be identical with that in the spirometer only if the respiratory quotient was unity (1.0). This correction is not applicable to the testing procedure being reported because nitrogen is eliminated by the oxygen breathing.

Comparative results and reduplication of results. Table 1 gives the results of helium dilution tests for residual air in 60 patients compared with Robinson's data reported in an article by Baldwin and associates. In the later series the residual air was measured by the oxygen dilution method of Darling. It is impossible to make detailed comparisons because data on the height, weight, and body surface of individual patients are not available, but inspection of the data confirms a satisfactory clinical correlation.

Table 2 gives results of serial determinations in individual patients and points out the slight degree of variation in duplicate tests. Meneely and Kaltreider also reported similar variation in duplicate determinations with this testing procedure. Due to the decreasing efficiency of the intrapulmonary mixing characteristic of emphysematous decompensation, the degree of variation increases as the volume of the residual air increases.

One of the most meaningful methods for expressing the results with this technic is to compare the ratio of residual air to total lung volume with those recommended by Baldwin (table 3). This ratio varies according to sex and age, but rarely is above 35 percent. The ratio above 35 percent is usually interpreted as a pathologic degree of residual air indicative of generalized emphysema. The results in table 3 demonstrate that the testing procedure provides values entirely consistent with the best available ratios.

SUMMARY

A simplified technic for residual air determination using the principle of helium analysis with the katharometer has been standardized with normal individuals and the results compared to another large series in which a different technic was employed. The technic has been entirely satisfactory in its simplicity, ease of operation, correlation with other recognized procedures, and accuracy of duplicate determinations. Although a waterless basal metabolism machine was used as the spirometer in this study, any type of bellows bell type spirometer or respirometer is suitable. The presence of a blower system in the spirometer is desirable for effecting even distribution of the gas mixture.

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CARDIAC ARREST

In both the prevention and treatment of cardiac arrest adequate blood oxygenation and maintenance of circulating blood volume are the essential factors. It is possible that many instances of cardiac arrest could be prevented if proper precautions were maintained. The grave consequences of the combination of anoxia and a high level of circulating epinephrine on cardiac function can be produced both in the operating room and the laboratory. The fearful patient subjected to a hurried induction of anesthesia or to too much anesthetic agent in the absence of oxygen may be expected to behave in the same manner as the laboratory animal who is partially suffocated deliberately and at the same time given epinephrine experimentally to produce ventricular fibrillation or cardiac standstill.

—BRIAN BLADES M D

in *Journal of the American Medical Association*,
p 711 June 19 1954

DEMARCATIION OF BODY REGIONS AND BATTLE CASUALTY ANALYSIS

ROBERT H HOLMES M D
WILLIAM F ENOS J M D
JAMES C BEYER Cap MC USA

THE systemic study of the localization of war wounds is dependent upon a standard demarcation of body surface regions and the use of precise terminology as to position and direction

In studying wounds incurred in the Korean conflict¹ and in those of previous wars it is apparent that the various boundaries assigned to regions and areas of the human body have been shifted to suit the convenience of the investigator. There has also been much casual disregard for proper anatomic terminology. This state of affairs is not confined to the liberal interpretation of medico-military scientists. It has been a problem long recognized by academic anatomists internationally and much thought has been devoted to standardization of terminology and anatomic definition. With few exceptions the Basle Nomina Anatomica (B N A), the Birmingham Revision (B R) and the Jona Nomica Anatomica (J N A or I N A) are satisfactory standards for military usage. One notable exception, however, lies in the definition of the position of the body as upright with the upper extremities at the sides, the forearms and hands in full supination. This position of the forearms and hands is unnatural for a soldier in combat and when direction of the wounding agent and angle of missile incidence are taken into consideration is misleading. A position of the body upright, with the arms at the sides, the palms directed medially and the fingers extended is preferred.

In World War II Churchill² recognized the importance of adopting some universal standard of anatomic regional demarcation. Beebe and De Bakey also encountered the frustration of nonspecific misleading terms used to define position and direction and made a plea for uniform usage and accuracy in medical reporting. In their early casualty surveys Burns and Zuckerman were aware of this need for conformity and set up their standard of regional demarcation. In studies of battle casualties (1950-1953) in Korea

we,^{1 2} lacking any prescribed standard, attempted to formulate a similar system. Because of the demand for more and more specific localization of wounding, the problem has now gained added significance. Certain aspects of body armor design are intimately dependent upon such information. Other future demands must be anticipated.

Military medicine with its tendency toward conformity in general principles is ideally suited for the adoption of standard terminology and definition. By adhering to them each medical officer can contribute accurately to the research phase of casualty analysis and each medical report becomes one of statistical importance. In view of the rapid turnover of medical officers entering the military service from and returning to civilian life, it is only reasonable that they be provided with such a standard, rather than be permitted to exercise individual preference without an awareness of eventual statistical goals.

In view of these facts, an effort has been made to review all available standards of anatomic regional demarcation and to devise a composite system which will provide accurate data on the exact localization of wounding. Simplicity and ease of use have been foremost considerations in this effort. Proper anatomic terminology regarding position and direction has been long established. It remains only to encourage its common and consistent use.

In order to be of practical value under the stresses of combat medical care, any system of anatomic regional demarcation and terminology as to position and direction must be easy to visualize, to remember, and to use. In addition, there must be clear indoctrination of personnel as to the reasons for introducing such a standard and a recurrent appeal for accuracy in its use. Much medical reporting in time of war is of necessity completely dependent upon individual responsibility. Eventual statistical data are, therefore, controlled directly by the formulation and adoption of universal procedures and proper guidance in their application.

The standard to be presented was developed primarily to fill the need encountered in wound ballistics studies of battle casualties in Korea. It is of first importance to establish and record the exact location of the missile hit or its equivalent factor, the wound itself. The number of hits and their specific location comprise a single order of data which must stand alone in statistical tabulation. The proposed standard of surface demarcation allows for this requirement; it is also adaptable to a consideration of missile passage and wounds of exit. It is emphasized, however,

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that these data although related are of separate statistical significance

BODY REGIONS

The following standard for demarcation of anatomic surface regions is proposed. Each region will be defined individually describing all boundaries formed by contiguous anatomical structures (figs 1-6)

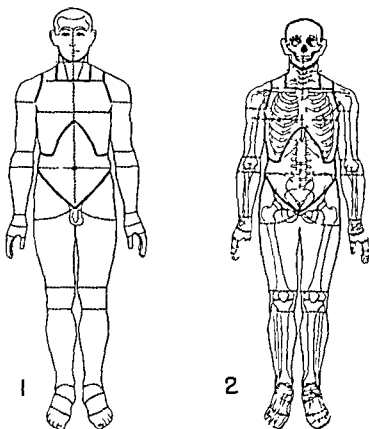


Figure 1 Body regions anterior surface view Figure 2 Body regions anterior skeletal view

Head The head is that part of the human body enclosed by a line beginning anteriorly and superficially from a point in the midline located at the nasofrontal junction and extending laterally on both sides along the supraorbital margin sloping downward to the zygomatic arch and to the mastoid process thence posteriorly along the superior nuchal line to the external occipital protuberance

inferiorly by a line beginning on the anterior surface at a point in the midline of the subcostal angle at the junction of the xiphoid process with the body of the sternum and extending laterally downward on both sides along the inferior margins of the costal cartilages of the lower six ribs and then to the spinous process of the twelfth thoracic vertebra. Laterally and superiorly the thorax is demarcated by the limits of the upper extremity

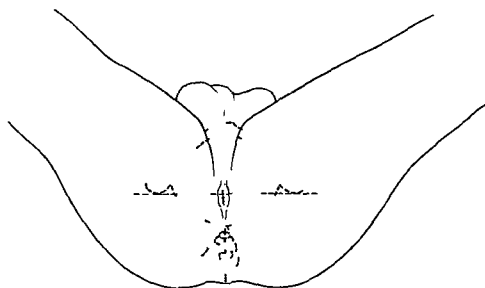


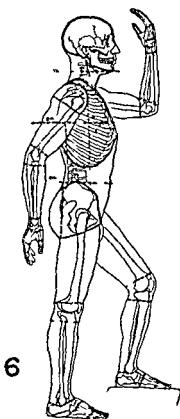
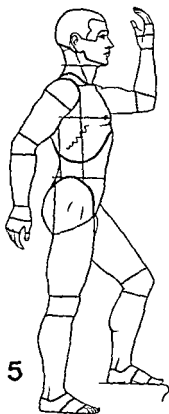
Figure 7 Perineum

Abdomen The abdomen is that part of the human body enclosed superiorly by a line beginning on the anterior surface at a point in the midline of the subcostal angle at the junction of the xiphoid process with the body of the sternum and extending laterally downward on both sides along the inferior margins of the costal cartilages of the lower six ribs, and then to the spinous process of the twelfth thoracic vertebra. The abdomen inferiorly is enclosed by a line beginning on the anterior surface at a point in the midline of the symphysis pubis and extending laterally on both sides along the inguinal ligaments to the anterior superior iliac spine, sloping over the crest of the ilium and posteriorly to the base of the sacrum in the midline.

Perineum The perineum is that part of the human body considered to be the floor of the abdomen, enclosed by a line beginning on the anterior surface at a point in the midline of the symphysis pubis and extending laterally on both sides to the ischial tuberosities and posteriorly to the tip of the coccyx (fig 7).

Upper Extremity The upper extremity is that part of the human body enclosed superiorly by a line beginning on the anterior

surface at the suprasternal (jugular) notch and extending laterally on both sides along the superior margin of the clavicle to a point at the junction of its medial and middle thirds then posteriorly over the superior margin of the trapezius muscle in line with the superior (medial) angle of the scapula and directed medially to the midline at the level of the spinous process of the seventh cervical vertebra



Figur 5 Body gi s later l urfa view Figur 6 Body regi lat l
kei t l w

Thorax The thorax is that part of the human body enclosed superiorly by a line beginning on the anterior surface at the suprasternal notch and extending laterally on both sides along the superior margin of the clavicle to the junction of its medial and middle thirds then posteriorly over the superior margin of the trapezius muscle in line with the superior angle of the scapula and directed medially to the midline at the level of the spinous process of the seventh cervical vertebra The thorax is enclosed

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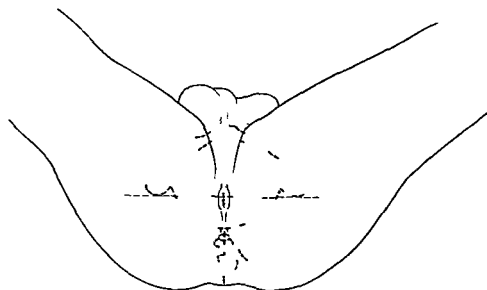


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Upper Extremity The upper extremity is that part of the human body enclosed superiorly by a line beginning on the anterior

surface at the junction of the lateral and middle thirds of the clavicle sloping downward laterally, and inferior to the coracoid process of the scapula to the anterior axillary line at its origin. The upper extremity is enclosed inferiorly by a line beginning on the posterior surface at the junction of the lateral and middle thirds of the clavicle extending posteriorly over the spine of the scapula to the origin of the posterior axillary line and across the axilla to the anterior axillary line.

Shoulder The shoulder is that part of the human body enclosed superiorly by a line beginning on the anterior surface at the junction of the lateral and middle thirds of the clavicle sloping downward and laterally to the origin of the anterior axillary line below the head of the humerus and across the rounded contour of the deltoid muscle to the origin of the posterior axillary line then upward across the spine of the scapula to a point on the surface at the junction of the lateral and middle thirds of the clavicle.

Lower Extremity The lower extremity is that part of the human body enclosed by a line beginning on the surface anteriorly at the pubic tubercle extending upward and laterally to the anterior superior iliac spine, over the crest of the ilium posteriorly to the base of the sacrum downward to the tip of the coccyx inferiorly over the tuberosity of the ischium and anteriorly to the middle of the symphysis pubis.

Hip The hip is that part of the human body enclosed by a line beginning on the surface anteriorly at a point in the middle of the symphysis pubis and extending laterally to the anterior iliac spine and the tubercle at the summit of the iliac crest then downward and posteriorly to the lateral entrance of the gluteal fold superficial to the inferior border of the greater trochanter of the femur then anteriorly around the head of the femur to the middle of the symphysis pubis.

Buttock The buttock is that part of the human body enclosed by a line beginning on the surface posteriorly at the tip of the coccyx extending upward to the base of the sacrum in the midline and curving laterally to the prominent tubercle at the summit of the iliac crest then downward to the lateral entrance of the gluteal fold and medially over the tuberosity of the ischium to the tip of the coccyx.

SUBDIVISIONS OF BODY AREAS

Surface demarcation accounts for the principal anatomic regions namely head face neck thorax abdomen upper extremity and lower extremity. The shoulder perineum hip and buttocks are considered to be principal areas within these regions.

The shoulder is a part of the upper extremity, the perineum is the floor of the abdomen, the hip and buttock a part of the lower extremity. These areas have been defined as clearly as possible because experience has shown that identification of these particular boundaries usually suffers from variable interpretation. Objection may be made to the use of these terms and areas at all, but it has been found that accountability for them in statistical tabulation is mandatory because of traditional usage, and, indeed, such recording is of some specific clinical value. Exact localization of boundaries for these areas should remove any objection to their usage, because the most important factor for present consideration is actually the establishment of a common standard. Accuracy in medical reporting can then, and only then, be obtained.

It is readily noted that all of the landmarks used in plotting the anatomic regions and areas are not always truly those of surface topography. The human body simply does not lend itself to such consistency, therefore, reference to the skeletal system has been indicated wherever more convenient. It is believed that one can apply the proposed boundaries with greater ease if both surface and skeletal landmarks are visualized.

It is also desirable to obtain uniformity through a system of subdivision of all the principal anatomic regions. The following plan, based on simplicity and ease of application, is proposed.

The entire human body can be subdivided into right and left halves by a median plane utilizing the mental protuberance and symphysis pubis as focal points anteriorly, and the external occipital protuberance and tip of the coccyx posteriorly. The principal regions can then be subdivided into quadrants by successive transverse planes at levels of the inferior border of the nose, the spinous process of the fourth cervical vertebra, the nipples, and the umbilicus. The lateral areas of the body are identified by a parallel downward extension of the anterior and posterior axillary lines. Subdivisions of the head are easily formed by use of its natural boundaries into frontal, temporal, mastoid, parietal, and occipital areas. Likewise, the face can be divided into nasal, orbital, maxillary, and mandibular areas. The neck is subdivided on each side into an anterior and posterior half by the natural boundary of the sternocleidomastoid muscle. The perineum is subdivided into an anterior and posterior half by a line connecting the two ischial tuberosities.

Subdivisions of the extremities offer little confusion if the shoulder, hip and buttock are clearly defined. Occasionally there is incorrect reference to the arm as an inclusive term for

the upper extremity rather than a distinct recognition of the forearm as a separate anatomic area. The upper extremity is subdivided into the following natural areas: shoulder, arm, elbow, forearm and hand; the lower extremity into the hip, buttock, thigh, knee, leg, and foot. Long bones are further subdivided into proximal, middle and distal thirds. The joints have obvious boundaries but may require roentgenographic examination for exact information. The wrist and ankle are somewhat vague in definition but for practical purposes offer small chance for error. Reference to the antecubital or popliteal fossae should include a statement as to position superior or inferior. Fingers and toes should receive exact designation rather than loose notation as hand or foot.

TERMS OF POSITION AND DIRECTION

The most common terminology appears to be as follows:

1 Median plane. A vertical anteroposterior plane passing through the center of the trunk dividing the body into right and left halves.

2 Sagittal plane. Any plane parallel to the median plane.

3 Coronal plane. A vertical plane at right angles to the median plane, also known as a frontal plane, dividing the body into anterior and posterior parts.

4 Transverse plane. A plane at right angles to both the median and coronal planes, dividing the body into relative levels.

5 Terms of position and direction: (a) Anterior, ventral, front; (b) Posterior, dorsal, back; (c) Superior, cephalic, above, upper; (d) Inferior, caudal, below, lower; (e) Medial, near to and (f) Lateral, farther from the median plane; (g) Superficial, nearer to and (h) Deep, farther from the surface; (i) External, outermost and (j) Internal, innermost part of cavity wall or hollow viscera; (k) Proximal, that part of a limb nearer to and (l) Distal, that part of a limb farther from the attached end.

SUMMARY

Exact localization of missile hits through demarcation of body regions is essential for designing body armor and for giving statistical value to medical data on battle casualties.

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THE TREATMENT OF VARICOSE VEINS DURING PREGNANCY

MICHAEL J CAVANAGH *Captain, USAF (MC)*

PAUL C WEINBERG *Captain, USAF (MC)*

A STRONG prejudice against the active surgical treatment of varicose veins in the pregnant woman has existed since the time of Ambrose Paré. The therapy outlined by standard obstetrical texts is conservative.^{1,2} Definitive surgery is objected to because of the belief that the varicosities will disappear after delivery and because treatment during pregnancy is considered to be completely ineffective. This is far from the truth. Many of the varicosities appearing during pregnancy remain after delivery and continue to be symptomatic. Several reports have recently appeared presenting series of patients treated surgically during pregnancy with excellent and lasting results.³⁻⁵

Extensive surgical procedures for the cure of patients with varicose veins can be conducted during pregnancy with complete safety for the mother and child. The young mother who is incapacitated because of pain, edema, and fatigue is rapidly able to assume full control of her household and presents a most gratifying postoperative result.

The most urgent indication for surgical therapy is the prevention of intravascular thromboses and pulmonary emboli. In the past two decades there has been a marked lowering of the maternal mortality caused by sepsis, toxemia, and hemorrhage; as a result, pulmonary emboli have become more prominent statistically. Collins⁶ pointed out that a review of any large series of patients, either gynecologic or obstetric, shows that anywhere from 10 to 20 percent of the deaths are due to pulmonary emboli. Varicose veins of the lower extremities are one of the more important predisposing factors in thrombo-embolic disease, and hence active surgical treatment becomes a necessary prophylactic measure.

Quattlebaum and Hodgson³ studied 600 consecutive obstetric patients and found 11 percent to have significant varicose veins. Of the 52 patients with varicose veins treated conservatively,

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21 developed subsequent thrombophlebitis and two patients demonstrated nonfatal pulmonary emboli. Of the 14 patients treated surgically only one developed thrombophlebitis and none developed pulmonary emboli.

PATHOPHYSIOLOGY

Pregnancy adds several factors to the development of varicose veins in the susceptible person. The enlarging uterus increases intra abdominal pressure and occludes the large venous trunks of the abdomen and pelvis causing an increase in hydrostatic pressure in the veins of the lower extremities. Adams⁷ has stressed the importance of the sump action of the right heart in decreasing the gravitational pressure of the column of blood on the veins of the extremities. The increased intra abdominal pressure of pregnancy interrupts the column of blood in the abdomen and diminishes the sump effect. It is well known that the standing pressure in the superficial lower limb veins is the same before and after ligation. As Adams pointed out the most significant result of ligation is cessation of the marked increase in pressure following straining or coughing.

Veal and Hussey⁸ in measuring the popliteal venous pressure during pregnancy found readings above normal but the increase was greater in those patients with varicose veins. His most significant finding was a noticeable unilateral increase in venous pressure in patients with unilateral varicose veins. Other factors proposed as explanations for varicosities in pregnancy are the competition for common iliac emptying by increased flow from the internal iliac vein and the theoretic arteriovenous shunt action at the placental site.

INDICATIONS

Very few antepartum patients will require surgical therapy. There is no question that the great majority of the dilated veins found during pregnancy will resume their normal caliber following delivery. Patients with extensive symptomatic varicosities should be evaluated for treatment in the same manner as the nonpregnant patient. The adequacy of the deep circulation and competence of the valves is ascertained by the usual tests. A list of indications for surgical treatment that has proved most satisfactory is a modification of the one advanced by Peyton and Loop⁹ and includes (1) pre-existing varicosities (2) incapacitating vulvar varicosities (3) history of thrombophlebitis (4) advent of thrombophlebitis or (5) marked subjective manifestations and demonstrable incompetence of the saphenous system.

At this hospital symptomatic varicosities present prior to pregnancy are an essential prerequisite for surgical treatment.

TREATMENT

The patient is admitted to the hospital the afternoon prior to operation, and the location of the major varicosities and "blow outs" is mapped on the skin with an indelible marking solution, such as brilliant green. At operation, anesthetics such as thio-pental sodium (sodium pentothal), nitrous oxide, and oxygen anesthesia have proved most satisfactory. A careful high ligation with identification and division of all the tributaries up to the sapheno femoral junction is performed. To this is added retro-

TABLE 1 Summary of cases

Case number	Age	Duration of pregnancy (months)	Duration of symptoms (years)	Treatment
1	19	7	2	Right high ligation stripping left multiple resections
2	28	5	5	Right high ligation stripping multiple segmental resections
3	23	4	6	Right high ligation multiple resections
4	42	5	8	Left high ligation stripping
5	29	4	7	Bilateral high ligation multiple segmental resections
5	29	7	7	Bilateral multiple segmental resections
6	19	4	2	Ligation of major veins of labia
7	18	6	1	Right high ligation multiple segmental resections

grade intraluminal stripping extraluminal stripping, and segmental resections as indicated by the individual case. A padded pressure dressing is applied and the lower extremities are elevated on pillows for eight hours. The patient is ambulated the evening of operation and discharged from the hospital in 24 to 48 hours. She is seen in one week for removal of sutures, and then at intervals of two months. Compressive bandages are advised throughout the pregnancy, labor, and immediate postpartum period because of the susceptibility to thrombophlebitis.

RESULTS

In the past two years, seven patients with severe varicose veins have been selected from the antepartum clinic of this hospital for surgical therapy (table 1). The patients ranged in age from 19 to 42 years, and the duration of pregnancy varied from the fourth to seventh month. The patients all demonstrated pro-

On the 12th of March 1941 the patient was seen and the onset of her symptoms from one to eight years preceding the onset of pregnancy. Six of the seven patients experienced almost immediate relief from symptoms and demonstrated almost complete curing of the varicosities. The remaining patient (case number 5) a 24-year-old para 3 gravida 3 with bilateral varicosities was operated upon in the fourth month of pregnancy and a bilateral high ligation with multiple segmental resections was performed. The patient was improved by continued observation and the symptoms. Follow up examination revealed several enlarged residual peripheral and labial varicosities. She was re-admitted to the hospital during the seventh month of pregnancy and multiple segmental resections were performed with improvement but not complete relief of symptoms. One patient (case number 6) had experienced a spontaneous rupture of labial varicosities in the fourth month of a previous pregnancy. Pronounced symptoms of labial varicosities recur in the fourth month of the current pregnancy and a ligation was performed with excellent results. There were no complications of any type encountered and no creation of inducement of labor with the procedure.

SUMMARY

Pregnancy is not a contraindication to the surgical treatment of varicose veins. The relief of symptoms obtained in patients incapacitated by varicose veins during pregnancy by proper treatment is most gratifying. The elimination of varicose veins is an important prophylactic measure in the prevention of thrombo-embolic disease. High ligation and vein stripping appears to be the most successful surgical approach.

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USE OF PHENYLINDANEDIONE IN ACUTE THROMBOEMBOLIC DISEASE

Observations in 35 Patients

CHONG SUHL KIM Lieutenant MC ROAN

THE physiologic mechanism of blood clotting was first described in 1904 by Morawitz¹ and by Fuld and Spire.² A variety of accessory factors and reactions in the blood clotting mechanism have been noted since that time.³ According to Quick,⁴ blood clotting is an autocatalytic cycle in which four reactions are involved, and all of the factors essential to the process, namely thromboplastinogenase, thromboplastinogen, calcium, prothrombin, AC-globulin⁵ (labile factor factor V⁶), serum prothrombin conversion accelerator (SPCA)¹⁰ and fibrinogen, are to be found in the blood plasma.

The existence of substances which delay the clotting of the blood either *in vitro* or *in vivo* has been known for a number of years. One of these, heparin sodium, was discovered by McLean¹ in 1916. The action of heparin sodium is believed to be due to its effect on thrombin. The simplest method for estimation of the anticoagulant potency of heparin sodium depends upon the clotting time of whole blood, determined most commonly by the three tube Lee-White modification of Howell's test for clotting time.² An adequate heparin¹¹ effect is considered to be a coagulation time of 30 to 45 minutes as compared with a normal coagulation time of nine to 15 minutes by the Lee-White method.

If heparin sodium were effective orally it would be considered an essentially ideal anticoagulant, but because of the need for frequent injections when it is used an orally effective anticoagulant would be preferable.

Research on hemorrhagic "spoiled sweet clover disease" in cattle, a disease characterized by hemorrhage with signs of hypoprothrombinemia, led to the discovery of bishydroxycoumarin (dicumarol) about 1940. This compound and several chemically related substances (coumarin derivatives) have subsequently

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been used as anticoagulant drugs. A brief summary of the characteristics of coumarin derivatives based on a review of several references is presented herewith.

Bishydroxycoumarin

- 1 Requires 48 to 72 hours to produce an optimal effect
- 2 Effect persists four to seven days or more after discontinuance of therapy
- 3 Daily prothrombin time test required
- 4 Cumulative effects noted
- 5 Initial dose 300 to 400 mg
- 6 Maintenance dose 100 to 200 mg

Ethyl biscoumacetate (tromexan ethyl acetate)

- 1 Optimal effect of therapy in 18 to 24 hours
- 2 Effect persists 24 to 48 hours after withdrawal of drug
- 3 Daily prothrombin time test required until maintenance dose is established thereafter on alternate days or once or twice weekly
- 4 Reduced cumulative effects noted
- 5 Initial dose 1500 to 1800 mg
- 6 Maintenance dose 600 to 900 mg (Regulation of dosage may be difficult. Tillch and Gilchrist found that individual requirements for ethyl biscoumacetate vary considerably and the response to the drug may fluctuate through wide range from day to day in the same patients.)

Cyclocumarol (cumopyran)

- 1 Requires 24 to 36 hours to develop optimal effect
- 2 Effect persists seven to 10 days or longer after therapy is discontinued
- 3 Cumulative action
- 4 Initial dose 200 to 300 mg
- 5 Maintenance dose 100 to 200 mg

Reporting on the three above mentioned drugs in 1959, Barker and associates concluded that, (1) Ethyl biscoumacetate is the most rapid in its action and its effect disappears most quickly when the drug is discontinued. (2) These potential advantages are offset to some degree by greater difficulty in maintaining the prothrombin time within the therapeutic range particularly during the first two weeks of treatment. (3) Cyclo-

cumarol produces a somewhat more consistent hypoprothrombinemia with less tendency to daily fluctuations, but the hypoprothrombinemia tends to persist for a long time after the drug is discontinued. (4) All three drugs are equally effective in preventing thrombosis but are attended by some risk of bleeding

In 1943 studies by Kabat and associates,¹⁶ relating to the toxicity of certain compounds, led to the observation that a number of indanedione derivatives given orally were capable of inducing hypoprothrombinemia in laboratory animals

Several groups of investigators¹⁷⁻²¹ have studied the effect of phenylindanedione (phenindione, hedulin). Both laboratory and clinical research²² indicate that this drug has a rapid prothrombinopenic action, a low order of toxicity and lack of effect on the concentration of factor V

This article presents a clinical report on the use of phenylindanedione in 35 patients with acute thromboembolic diseases

MATERIAL AND METHODS OF STUDY

The types of acute thromboembolic disease affecting the 32 male and three female patients in this series were thrombophlebitis (14 patients), pulmonary infarction (two patients), myocardial infarction (17 patients), and auricular fibrillation (two patients)

The diagnoses were confirmed clinically and electrocardiographically. No selection of cases was attempted, only consecutive admissions were studied. The average age of the patients was 49 years, ranging from 22 to 74 years. Before therapy was begun, all patients were examined, their general physical condition evaluated, the presence or absence of hepatomegaly noted and their weight obtained. Employing a commercial thromboplastin (simplastin), daily prothrombin times were determined by the modified one stage method of Quick,²³ and were expressed in terms of percentage of normal prothrombin activity. Therapeutic control was considered acceptable between the range of 10 and 30 percent of normal. In this series of cases prothrombin levels were maintained in the range of 10 to 20 percent of normal in one group of nine patients (herein arbitrarily called "relatively strong response group") and between 20 to 30 percent in 26 patients (arbitrarily called "moderate response group")

Blood for an initial prothrombin determination was drawn before institution of treatment. Following completion of anticoagulant therapy, prothrombin determinations were obtained until values again reached normal levels. From these data, the "recovery period" (time required for prothrombin activity to reach 40 per

cent or above)' was determined. The incidence of prothrombin escape under treatment was also estimated because it was assumed that an elevation of prothrombin time above the 30 per cent level indicated inadequate anticoagulant protection.

Phenylindanedione was made available in centrally scored 50 mg tablets which could be broken into 25 mg portions when necessary. Laboratory and clinical experience demonstrated the desirability of administration of this drug in tablet form every 12 hours. This schedule produced a more rapid onset of therapeutic effect than a single dose at 24 hour intervals. It also facilitated estimation of the maintenance dose which in most cases remained constant throughout the period of therapy.

Frequent urinalyses, erythrocyte sedimentation rates and complete blood counts were done in all cases. Multiple liver function tests (serum protein, albumin globulin ratio, bromsulphalein and thymol turbidity) were performed in 10 patients after institution of treatment.

The routine management for all cases of myocardial infarction consisted of morphine at the onset for relief of distress, bed rest for four weeks, then graduated exercise.

RESULTS

Dosage. Oral doses of 200 to 300 mg of phenylindanedione were given initially. Those patients weighing 150 pounds or less were given 200 mg and those weighing over 150 pounds received 300 mg; these were given in divided doses of 100 or 150 mg each at 0900 and 2100 hours.

Frequency of Administration. As in other anticoagulant therapy (bishydroxycoumarin, ethyl biscoumacetate, et cetera) the maintenance dose must be gaged by the prothrombin time tested daily for at least the first four to seven days of therapy. Once the maintenance dosage is established, less frequent prothrombin determinations are necessary, depending on the individual reaction of each patient.

The average daily maintenance dosage was found to be 150 mg in the group receiving relative strong response (nine cases) and 100 mg daily in the group receiving moderate response (26 cases). The total amount of the drug administered to any one patient in this series ranged from 675 to 4 775 mg. Duration of therapy was from nine to 80 days. Maintenance dosage fluctuated in individual cases from 25 to 300 mg daily.

Figure 1 represents data from a patient with pulmonary infarction who was maintained on prothrombin levels of 10 to 20 percent of normal. Figure 2 is based on data from a patient with

a diagnosis of anterior myocardial infarction, well controlled on phenylindanedione, with levels between 20 and 30 percent of normal

Speed of Action and Recovery Thirty four patients in this small series of 35 responded to phenylindanedione with therapeutic

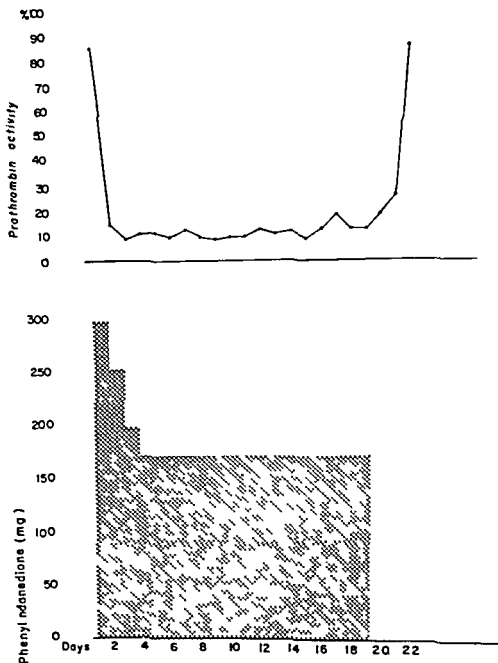


Figure 1 Prothrombin activity as related to phenylindanedione administration in a patient with pulmonary infarction, well controlled on divided daily doses of phenylindanedione (prothrombin activity between 10 and 20 percent of normal)

tic effect on their prothrombin time. This occurred in 12 hours in three patients, 24 hours in 18, 36 hours in four, and 48 hours in nine patients. The average time necessary to achieve a therapeutic effect was 26 hours.

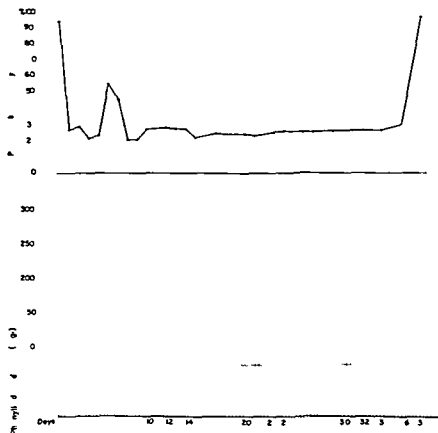


Fig. 1. Prothrombin activity of a patient 10 days after myocardial infarction, with continued divided daily dose of phenylindandione (prothrombin activity between 70 and 80 percent of normal).

Prothrombin escape (above 30 percent activity) while under treatment occurred in eight patients (23 percent of this series). This indicates that adequate protection was not maintained by the dosage employed. When the daily dosage was increased by an additional 5 to 150 mg, escape was mitigated and the prothrombin time promptly fell to therapeutic levels in 24 to 48 hours. In three other patients on average dosage of phenylindanedione, very low prothrombin times (less than 10 percent of normal) were obtained. This was promptly corrected and the hazards of hemorrhage averted by the simple expedient of omitting the anticoagulant for the next day or two.

The recovery rate of prothrombin time after discontinuance of phenylindanedione in 21 patients (60 percent) was 48 hours or less. The remainder, with the exception of two patients on whom information is not available, showed complete recovery in 60 to 112 hours. The prothrombin time rapidly approached normal within one to three days before it actually returned to pretreatment levels. Recovery rate of prothrombin time is presented in table 1. The average recovery rate was 47 hours.

TABLE 1 Time for return of prothrombin level to normal after discontinuance of phenylindanedione

Time (hours)	Patients	
	Strong response group	Moderate response group
0-24		11
24-36	1	2
36-48	1	6
48-60	2	1
60-72	2	3
72-84	1	1
84-96	1	
96-112	1	

Individual Reaction and Toxicity Undesirable side effects, consisting of scarlatiniform rashes, polydipsia, polyuria, and tachycardia previously described by others,^{7, 11, 12} were not observed in this small series. No hemorrhagic episodes occurred among the 35 patients treated. A transient proteinuria, read as trace of albumin, was noted in three patients. This phenomenon occurred within the first few days of treatment and disappeared in every instance within several days while the medication was still being continued. Microscopic examination of urine was reported as negative, although some patients developed an orange-red urine for a few days early in the course of treatment. There were no demonstrable changes in erythrocyte sedimentation rate, red blood cell count, white blood cell count, and the differential count due to this drug. Tests of liver function in 10 cases were found to remain normal before and after the institution of treatment.

Resistance to Phenylindanedione Some patients treated with bishydroxycoumarin or with other injectable coumarin derivatives have manifested resistance to these anticoagulants. Initial resistance, in which adequate hypoprothrombinemia is never ob-

tained and delayed resistance in which the patient may respond well to the drug and then suddenly despite increasing doses of the drug the prothrombin time returns to normal. Observations reported by other workers had indicated that there was no specific resistance to phenylindanedione by mouth.

A 41 year old 175-pound man treated for myocardial infarction was found to be resistant to phenylindanedione. The patient responded to the drug however after the administration of phenylindanedione and bishydroxycoumarin was combined. He was given 2 050 mg of phenylindanedione over an 11 day period. The prothrombin time was never prolonged beyond 17 seconds compared to a control of 13 seconds. As illustrated in figure 3 his prothrombin activity between the sixth and eleventh days inclusively reflects his resistance to increasing doses of the drug. He was then placed on 900 mg of bishydroxycoumarin daily for the twelfth and thirteenth days but there was virtually no change in prothrombin time. From the fourteenth to the seventeenth day the patient was placed on the combined administration of 50 mg each of phenylindanedione and bishydroxycoumarin twice a day. On the sixteenth day the patient showed 26 percent of normal prothrombin activity. Bishydroxycoumarin was discontinued on the seventeenth day and subsequently (from the eighteenth through the twenty second days) the patient was maintained at therapeutic prothrombin levels on phenylindanedione alone.

Effect of Vitamin K on Phenylindanedione. It has been reported that vitamin K (water soluble) and vitamin K emulsion are efficacious as antagonists to phenylindanedione when given intravenously. The opportunity to study the antagonistic action of vitamin K did not present itself because there was no case of hemorrhage in this series.

Aureomycin chloramphenicol and oxytetracycline (terra mycin) may induce a marked prolongation of prothrombin time. The production of vitamin K is largely dependent on the action of the bacterial flora of the intestinal tract. When the bacterial flora are killed off or greatly disturbed by the oral antibiotics the production of vitamin K may sharply diminish. In such patients small doses of anticoagulants may cause a precipitous fall in prothrombin times. Because of this occult but nevertheless real danger no patients in this series received antibiotic therapy while under treatment with phenylindanedione.

One death due to myocardial infarction probably from extension of the thrombus occurred while the patient was under effective anticoagulant therapy. There was one episode of migrating thrombosis in a patient whose prothrombin determinations were maintained at therapeutic levels by daily doses of phenylindanedione. The diagnosis was pancreatic carcinoma.

with hepatic metastases. Although his prothrombin time responded well to 50 mg of oral anticoagulant daily the clinical course rapidly deteriorated and he developed terminal phlebitis. The

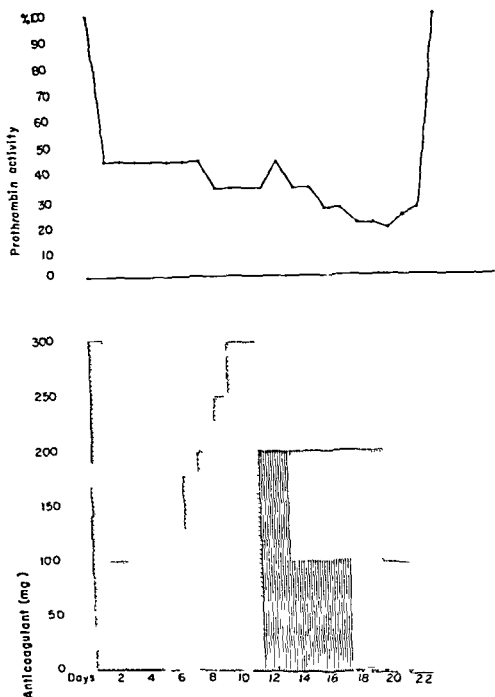


Figure 3 Prothrombin activity as related to administration of phenylindane dione and bishydroxycoumarin, separately and together in patient with myocardial infarction. Dotted lines represent therapy with phenylindane dione and vertically hatched area with bishydroxycoumarin.

apparent failure of anticoagulant therapy to prevent thromboembolic disease in this particular instance may be associated with the release of an excessive amount of thromboplastin due to destruction of tissue cells by malignant invasion.

DISCUSSION

Studies of the beneficial effects of anticoagulant drugs in the treatment of thromboembolic diseases have stimulated a search for an ideal agent. Such a drug should be nontoxic possess rapid onset of therapeutic effect and a shorter duration of action require a constant maintenance dosage and result in a prompt recovery after discontinuation of the drug. No one anticoagulant to date meets these ideal criteria. However phenylindanedione may be considered a rapidly acting prothrombinopenic agent. Therapeutic depletion of prothrombin activity was obtained in 12 to 48 hours after an initial dose of 200 or 300 mg. by mouth depending on body weight. The effect of phenylindanedione usually persisted from 24 to 96 hours in relation to the dosage employed.

SUMMARY

Phenylindanedione was administered by mouth for periods of nine to 80 days in 35 patients with acute thromboembolic diseases in order to produce and maintain a hypoprothrombinemia. The initial dosage was 200 to 300 mg. according to the weight of the patient. An average daily dose of 110 mg. maintained the blood prothrombin activity between 10 and 30 percent of normal in this series. An additional 50 mg. of phenylindanedione daily reduced prothrombin activity to 10 or 20 percent of normal. Prothrombin escape was controlled by increasing the daily dosage of phenylindanedione whereas unduly low prothrombin values were corrected by omission of the drug for one or two days. One patient resistant to phenylindanedione responded to combined bishydroxycoumarin and phenylindanedione therapy.

Ten patients in the series were investigated for possible impairment of liver or kidney function and no evidence for such a complication of the anticoagulant therapy was found. In the entire series of 35 patients no hemorrhagic manifestation was observed. One death occurred among the 17 patients with myocardial infarction while anticoagulant drugs were being administered.

CONCLUSIONS

Phenylindanedione possesses more rapid action and far less cumulative effect than bishydroxycoumarin. Its judicious administration is attended by little or no toxicity. While the total number of cases reported herein is too small to warrant statis-

tical analysis, it appears that in proper dosage by mouth phenyl indanedione induces a therapeutic degree of hypoprothrombinemia and thus aids in the management of thromboembolic disease

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BARBITURATE OVERDOSAGE AND POISONING

In contempo ary society barbitur te overdosage and pois ning is a pressing problem f cing the med cal profession The problem con sidered in t totality s one exceedi gly difficult to solve and the cur ent f ar is that the dilemma will grow more acute with the incre s ing use and misuse f ba b tur te drugs Indeed the problem with its many f cets i not only c cer ed with the actual ingestion of toxic to-lethal m nts nd ther py of the re ulta t coma It is a problem nv lv g the bilty of l y persons to obtain these drugs with com parate e se ft n w tho t a prescript n f om a qualified phys ci n and he ce ur ide the ealm of close therap ut c ntrol Also to be consid ed the e se of the s cid attempt th ava lability of these drugs t young ch ldren w th th r lack of judgment and to old per o s w th o gan mental d seas nd memory defect In the psych att c field there i the problem of the prev nt on of recurrent suicid l effort and the managem t of the frequent eurot c nd psychotic ex cerbatio s wh ch pec pit te the act f overdo age On reads too often i d ily pape s of the vict ms of ac te ba b turism nd alth ough d th from u cides re le s frequent they till number 11 5 per 100 000 The larning f ct s that the proporti n of suicides due to the b r b tur t s s ot me ely on th increa e but that the incr ase h rea hed st ndi g prop rt ns

—THEODORE B KROUSE M D

P nsyl ia M d l J urnal

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THE FUTURE OF MILITARY MEDICINE

BRIGADIER J N B CRAWFORD M B E E D RCAMC

AT this time the Royal Canadian Army Medical Corps is looking back on 50 years of achievement. Many doctors in Canada have contributed to the accomplishments of the past and this may be an appropriate time to give some thought to military medicine of the future

At the outset, it may be well to consider what is meant by the term "military medicine," and it will be helpful to recall the stated tasks of the medical service of the Army to maintain the health of troops in the field, to collect and transport sick and wounded, to maintain medical records, to maintain medical supplies, to treat the sick and wounded. The order in which these tasks are listed may be accidental. They are mutually interdependent and the successful accomplishment of any one depends upon the efficient performance of the others. Military medicine is that mixture of doctoring and administration which enables a doctor to accomplish these tasks. The individual medical officer may specialize in one or another of these functions, but the success of the medical service as a whole depends upon the complete integration of all of them.

The conscientious medical practitioner in civilian life looks upon his patient as an individual. The diagnostic aids which the doctor employs, the drugs which he uses in treatment and the length of time of convalescence are governed to some extent by the economic status of the patient, and the surgical equipment which the doctor uses is chosen largely in accordance with his individual preferences. The military doctor, while retaining his concern for the patient as an individual, finds this attitude modified somewhat by the fact that his patient is a cog in a fighting machine who must be returned to fight again as quickly as possible or, if he is so severely injured that he cannot fight again, he must be evacuated from the fighting area. The civilian medical practitioner who dons a uniform in service of his country in time of emergency finds that his individual preferences in the choice of surgical equipment must be limited to the over all problem of supply in a theater of war. When he complains that

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a patient in whom he is particularly interested and whose case he wishes to follow to completion is transferred away from his control he may have failed to appreciate that a tactical situation is developing which will shortly produce a heavy patient load and require every bed which can be made available in his particular hospital

In other words the civilian doctor works essentially as an individual and develops a very personal relationship with his patient. The military doctor must learn to work as a well trained member of a large and somewhat impersonal team while at the same time gaining the confidence of his patient during the period of his personal contact with him

While the sphere of treatment of patients is doubtless the most satisfying to the soul of every doctor the provision of competent treatment personnel is not the most pressing problem for the medical services of the armed forces in time of war. Always in past emergencies there have been and undoubtedly in the future there will be sufficient competent doctors who will flock to the colours to play this treatment role. This service will not be entirely without gain to them. Under conditions of war and in a relatively short period a wealth of clinical experience is offered which could be gained in no other way. It is not surprising that under the circumstances of war technical advances in treatment are made which are reflected to the benefit of the entire medical profession

The problem of provision of adequate treatment of the sick and wounded in time of war is great but equally important are the problems of organization and administration of medical services how to ensure that doctors are provided for the armed forces without crippling the medical care of civilians remaining on the home front how to ensure that doctors in the armed forces are employed with the utmost economy and in accordance with their special abilities how to keep troops free of those diseases which are endemic in a theater of operations or which may be introduced deliberately by the enemy how to maintain troops in a state of utmost fighting efficiency under the conditions prevailing in the ships aircraft or vehicles in use and with the equipment which they carry how best to collect the wounded from a field of battle and transport them quickly to treatment, how to supply the best possible in medical equipment instruments and drugs to the places in which they are required and how to maintain this supply under operational conditions all the while relating this requirement to the potential of the manufacturers and to the system of supply in allied forces and finally how to give guidance to the medical profession as a whole in those fields which are not covered in ordinary civilian practice for

example, the problems of flight at high altitudes and great speed, of human behaviour under conditions of extreme cold, of the treatment of casualties produced by such special weapons as the atomic bomb or poison gases, and of treatment of casualties in the mass as opposed to the treatment of the individual

These problems face the military doctor, and their solution demands much study and training of a very special kind. Moreover, this study and training must be going on constantly in time of peace in preparation for the possibility of war. It is not sufficient to rely upon native ingenuity to produce a suitable solution to these problems when an emergency is upon us. Thus, there is a very definite requirement for the doctor who is prepared to study these problems constantly, in short, who is willing to make a career of military medicine.

Such a career offers a great variety of interest, as can be gathered from what has been written above, and yet a career in military medicine does not appear to be popular among Canadians. Canada is unique among nations in that military service is entirely voluntary. No one is forced by law to spend any time in the armed forces and this applies equally to the medical services of the armed forces. This is a matter of governmental policy and it is not proposed to discuss its virtues or defects, but lacking universal military service, military medicine must attract young doctors through its own merits.

Why a career in military medicine has not made a greater appeal to the young Canadian doctor has been a matter of grave concern and serious study in the armed forces and should equally be a matter of concern to the entire medical profession of Canada.

Does the lack of interest of the young doctor in a career in the armed forces indicate that the military doctor does not receive sufficient pay? This has been advanced as one explanation for the situation and it is true that the average pay of medical officers in the armed forces does not equal the average pay of all Canadian doctors as shown in the returns from the Dominion Bureau of Statistics. The young doctor enters the Army in the rank of captain or an equivalent rank in the Air Force or Navy, and if he is married he will start with a take home pay of about \$5,300 a year after pension payments and income tax have been deducted. He can look forward with some certainty to promotion to the rank of major and this may occur fairly quickly. The starting pay after all deductions, for a married major is in the order of \$6,000 a year and this is subject to automatic periodic increases. Thus while the service medical officer cannot expect to sit in the lap of luxury, neither is he a candidate for the relief rolls. The discrepancy between the pay of the service medical officer and the civilian practitioner of similar medical

experience is to some extent offset by the freedom from the worries of running his own business generous periods of annual leave a very good pension plan and a general sense of financial security which the military doctor enjoys

Does the lack of interest of the young doctor in a career in the armed forces represent an attitude on his part that he cannot practise "good medicine in the services? One cannot deny that in a time of real peace in an army made up of young men selected on the basis of physique there are few wounded and only little in the way of sickness requiring treatment. In time of war of course there are more than ample opportunities for excellent clinical work and many have gained clinical experience which could never be acquired in civilian life Even in time of peace the services have made a very sincere attempt to improve the opportunities for good clinical practice Wherever military hospitals are situated they are equipped with the very best in the way of apparatus instruments and drugs The medical officer is under no necessity to consider the economic status of his patient nor need he feel that the patient must be returned to work before adequate convalescence has been completed He has complete freedom to call in specialist consultants either service or civilian whenever he feels such services are required and this is limited only by the geographical location of such consultants In service communities which are more or less isolated in Northern Canada the service medical officer provides complete treatment not only to the serviceman but to the dependents of servicemen and in these locations medical practice of the most comprehensive order is carried on by the service medical officer

The services have been remarkably successful since the end of World War II in implementing a programme of postgraduate education of the medical officers Present regulations permit a medical officer of the regular services to spend one year in each five year block of service in a type of activity which can be counted toward specialist qualification The success of this programme is measured by the very considerable number of service medical officers who hold specialist qualifications certificate or fellowship from the Royal College which they have obtained under service auspices

The Canadian Forces Medical Council is particularly interested in the question of professional advancement of medical officers It is felt that a good deal can be done to increase the professional interest in the medical services by adopting a policy of free interchange of professional personnel between hospitals operated by the three medical services Such policy has been adopted and a start has already been made on putting it into practice

Does the lack of interest of the young doctor in a career in the armed forces indicate his unwillingness to adopt a way of life which he feels does not permit him and his family to settle down in any one spot? To some people this nomadic form of existence is not unattractive, to others it represents a very real disadvantage. It is true that in the past the service doctor has been moved from place to place far too frequently. This has been necessitated by the commitments undertaken by Canada on three continents. It has been necessary to move doctors to the spots of greatest need. It is reasonable to suppose that as the numbers of available medical officers increase, so will the frequency of moves be decreased. It should be borne in mind that the services are no more anxious to move a medical officer than the medical officer is to be moved.

The military pattern of Canada has changed greatly in recent years. We met the challenge of the First World War by raising a "citizen army" which established an enviable reputation for the Canadian fighting man and after the war these soldiers returned to their civilian occupations. The standing army was reduced to very small size and its role was that of a training cadre only. We met the challenge of the Second World War in the same way and with the same success and in 1946 it was believed briefly that the standing army might return to its traditional peacetime role. However the growth of Canadian nationhood has brought upon us an increasing international responsibility. Little by little we are taking upon ourselves a part of that mantle so long worn by the United Kingdom. Today in a time of so-called peace, we are defending our country with troops stationed on foreign soil in Europe and in Asia. It is difficult to believe that these responsibilities will become less in the near future, and in the future, as in the past, wherever Canadian troops may be stationed they will be accompanied by Canadian medical units.

The future of military medicine depends upon the number of doctors who are prepared to practise it. In the above paragraphs a number of questions have been asked as to why more Canadian doctors are not prepared to accept this responsibility and it is probable that the answer to none of them alone is the answer to the problem as a whole. It appears to those of us who are engaged in the practice of military medicine that a challenge lies with the entire medical profession of Canada. So long as Canada must maintain armed forces, military medicine will have a role to play and its practitioners must come from the ranks of Canadian doctors. How this is to be accomplished is commended to the very earnest consideration of the profession as a whole.

THE NATIONAL RESEARCH COUNCIL

Its Nature and Functions

EDGAR M. NEPTUNE, J. L. I. I (MC) USN

TO MOST medical officers unless they have served previously in research and development assignment in Washington the National Research Council is little more than a name. Yet the Council though not a Government agency influences their activities in many ways. Service policies on blood plasma expanders antimalarial therapy physical standards water treatment sanitation and many other topics have been greatly influenced by NRC recommendations. Much of the military medical research program is reviewed by its committees. A brief report on its nature and functions may, therefore be of interest.

Both the Council and its parent organization the National Academy of Sciences owe their existence to the Government's need for competent impartial scientific and technical advice on military problems. The Academy was chartered by Congress during the Civil War as an independent advisory body much of the impetus for its formation came from the Navy and 12 of the 50 original members were officers of the armed services. In 1916 when another war threatened the National Research Council was formed by the Academy at President Wilson's request. A more flexible and effective organization it was designed to mobilize the resources of the nation's scientific and technical societies to deal with the increasingly complex problems of war.

The membership of the Council includes representatives of the government appointed by the President representatives of scientific and technical societies and members at large chosen to round out its scientific competence. The Council is subdivided into eight divisions * which conduct its affairs in their respective fields of science. Day-to-day administration is carried out by a full time resident staff.

Physical Sciences	Mathematics	Engineering	Industrial Research	Chemistry
Chemical Technology	Earth Sciences	Medical Sciences	Biology	and Agriculture
and Anthropology	and Psychology			

Mathematics	Bureau of Medicine	Surgery Department	Fish and Navy	Weather and D.C.
Lt. Nip	W. G. D.	U. S. Naval Medical Research	Archives	U. S. Navy
Egypt				

Medical research proposals from civilian scientists submitted to the Department of Defense agencies for financial support are frequently referred to the Division of Medical Sciences and review of such proposals may be a significant part of a committee's agenda. A committee may also conduct informal discussions or formal symposia on timely and pertinent scientific problems.

There are a few committees that are charged with giving more general advice on policies and broad programs. The Committee on Naval Medical Research advises the Navy concerning its entire intramural medical research program. A new Committee on Army Medical Education is undertaking a comprehensive study of education, training, and career management in the Army Medical Service. The Committee on Veterans Medical Problems has guided the Veterans Administration in its program of follow-up studies of military casualties and other contractual medical research.

Financial support for the extensive activities of the Division of Medical Sciences and the full-time professional staff is derived from contracts with the various agencies and organizations, both public and private, that make extensive use of its advisory services. In keeping with the Council's charter, the Division is prepared to advise other agencies upon request insofar as may be feasible without contractual support. However, the Council receives no direct appropriations from the Congress, and its endowment income is small.

As indicated previously, the chairman of the Division is given a great deal of authority for the conduct of its advisory activities and bears responsibility for the scientific validity of any advice that the Division offers. The activities of the Division, however, are reviewed periodically by an elected executive committee, and again at the annual meeting by the membership of the Division as a whole.

Among the many scientific advisory bodies in Washington, the Academy Council occupies a unique position. It derives official status from the Academy Congressional charter and from the Executive Order under which the Council operates, and yet, being independent of the Government, it is free of administrative and political pressures. Having no authority, it builds no empires; its advice is sought, not imposed. Bias is avoided because committee members are chosen by independent scientists rather than by those who seek the advice and serve voluntarily without remuneration. In these principles lies the strength which has preserved its influence and prestige throughout the vast upheavals of the past 91 years.

THE NAVAL INDUSTRIAL DISPENSARY

A Valuable Training Experience for the Young
Military Physician

THEODORE F. KROUSE, L. *and* J. J. CLEGG
EGBERT WAGENBORG *Host* *Editor* *of* *the* *NA*

AS all discerning professional readers know, the current civilian medical literature is composed for the most part of articles about the more scientific aspects of medicine. One reads much about clinical applications, basic research, and case reports. Statistical compilations are numerous. The details when one considers the great number of specialties are so staggering in volume and complex in presentation that they are impossible to assimilate; therefore there have developed "summary journals," journal clubs, conferences, and symposia.

In the narrower realm of military medicine the problem is not much simpler. Articles in the journals devoted to the military physician are nearly as varied. For example, the Naval Establishment is the source of articles on the admittedly fascinating fields of amphibious aviation, submarine sea duty, and hospital medicine; there also are articles from the epidemiologic research teams and the recently opened field of arctic or cold weather medicine.

Notable by his absence is the spokesman for dispensary medicine. At this level where much of ambulatory medicine is practiced, one finds a most unanticipated and unusual opportunity, seldom appreciated, for medical personnel to function on a very broad base of activity. Particularly wide is the spectrum of activity when the dispensary is civilian industrial in type and the medical officer is on duty alone. This article therefore presents some aspects of dispensary practice and procedure which are not readily discernible in an industrial activity. Because the vast majority of medical officers come to naval dispensaries without prior indoctrination or orientation, dispensary practice proves to be a strong testing of their adaptability, ingenuity, and aggressiveness within the flexible framework of the Manual of the Medical Department, Naval Regulations, and current directives.

A dispensary is a medical treatment facility primarily intended to provide examination and treatment for ambulatory patients arrangements for the transfer of patients requiring bed care and first aid for emergency cases Though basic these functions of the dispensary are not the only ones Dispensaries are also intended to perform a wide variety of nontherapeutic activities related to the health of the personnel served such as physical examinations inspections and immunizations Bed care is not provided on occasion a dispensary may render visiting care of patients in their own quarters

Naval dispensaries are universally distributed supporting such diverse activities as shipyards port bases air stations supply depots manufacturing plants and island bases It has been our privilege to have served in a variety of these installations A description of the important considerations in managing a dispensary supporting a very large aviation supply depot will illustrate problems common to all installations In examining the three general areas of dispensary work—administrative, general medical and industrial health and sanitation—let us consider those features which make the experience of dispensary service a rewarding one

ADMINISTRATIVE DUTIES

Orientation The physician unfamiliar with this type of duty may be assumed to have had no previous indoctrination This assumption is usually justified A short indoctrination course sponsored by the command is most useful at this time Such a course familiarizes the physician with the total structure and function of the activity rather than with the medical facilities only All too often a military physician without proper indoctrination knows only the dispensary (or just the area of the dispensary to which he is assigned) the parking lot officer's club and the main gate to home And nothing else This is what we like to call medical myopia a manifestation of a narrow viewpoint and hence a viewpoint to be condemned Through the indoctrination course the physician becomes familiar with most of the job classifications and becomes conversant with the technical language of the activity This wide knowledge gains him the respect of nonmedical persons prepares him to speak intelligently at conferences and establishes widespread rapport He gains a favorable vantage point from which to treat occupational injuries with the proper comprehension of the dynamic interrelationship of employee and working environment The physician should soon come to realize that his role in industrial military medicine is almost identical with that of his colleague in civilian industrial medicine—giving prompt treatment to the patient while representing the employer's interests

If no course is planned the physician should take a number of "field trips" in the first few weeks and orient him self

Filing Systems The filing system is the very heart of administration and medical personnel would do well to survey this area. Experience with records stands one in good stead for the business side of medicine whether one "goes regular" or returns to the civilian world. Maintenance of good notes and records for the next officer and his enlisted associates is a moral responsibility. Also the physician may be on duty at night or on a weekend when for some reason a record may be necessary and in the absence of the corpsman ignorance of the filing system may render an emergency more complicated. Not the least of the benefits is the physician's opportunity to learn and understand the Hospital Corps function and to inspect, suggest improvements, commend and criticize on a daily basis. The physician who waits for a yearly inspection party to uncover gross errors is derelict in his duty.

Narcotics and Alcohol Responsibility for the crucial supplies rests directly on the physician and is peculiar for two reasons. First the term "narcotic," like the terms "opium," "drugs," "sleeping pills," "stimulants" an exaggerated concern in the fearful or ill informed layman. That the supplies can be like an ogre and a monster to line and supply corps officers is very understandable and excusable. It is the duty of medical personnel to take the subject of narcotics most soberly. Superiors must be assured and convinced of our integrity. Supplies should be checked frequently. All security regulations must be adhered to in the strictest sense. Small amounts should be dispensed as needed. Prescriptions should be written immediately upon dispensing and logged properly. Legibility of record is important. All rewrites and erasures should have an explanatory remark and only one corpsman should be responsible for the records. We have spent many hours digging up old records assembling loose prescriptions, figuring the old usage rates, interpreting hieroglyphic scribblings, weighing powders, counting pills, measuring volumes, taping homogeneous items together and constantly checking with "the book." In our mind the time is always available the effort is not too great, and the results are satisfying. And the need never arises when one can find the barn door after the horse is stolen.

Second there is always a very real possibility that drug addicts and promiscuous users are employed with their hands. We have encountered such persons and have known only a suggestion to be potentially a most embarrassing situation. They must be identified, closely observed, handled with a heavy hand, and in some cases sternly warned.

Civilian Medical Records A health biography on each employee is a necessary record. A card system has recently been introduced at our activity which enables us to maintain a rapid check on the chronologic course of any employee's complaints and the resulting treatment. All manner of details can be recorded such as telephone calls to the employee's home, nontherapeutic investigations, poor co-operation with the Medical Department, and sources of contact with relatives and friends if the patient should be absent. There have been occasions when supervisors of such employees have been aided by information on our cards. Although records of occupational injuries are maintained separately, a note of each such injury is made on the above cards and any significant relationships are made obvious. The physician contemplating his return to civilian practice will find that these cards are identical with the type used in private practice.

Disaster Plan Supervision of a disaster plan is a necessary function. In these times the military medical man recognizes the dynamic changes in concepts of warfare. He visualizes the probability of all-out conflict as a sudden catastrophic unanticipated attack upon a civilian populace remote from a front-line area. Hence the Medical Department expects to co-operate intimately with other military and civilian agencies in planning for such an emergency. In setting up plans for co-ordination the department must be aware of the specific amount and location of everything from plasma and blankets to cots and bandages. It is emphasized that interest in this preparation has to be taken now, not after the first alarm!

Disaster Personnel Training Personnel must be trained to support the medical officer in event of emergency. Training may be in the form of lectures and demonstrations twice a week. At this activity a 12 lecture Primary Training course and six lecture Refresher Training course are given which cover a sensible and practical range of subjects such as hemorrhage, asphyxia, shock, wounds, type and location of our disaster supplies and their uses, and gas and atomic casualties. The courses are informal seminars in character and given personally by the medical officer. Every effort is given to consider this training as part of our primary mission and therefore to maintain motivation at a high level according to current techniques.

Medical Supplies Medical personnel become familiar with their stores by perusing the newly issued Federal Standard Stock Catalogue, the storeroom, and the inventory books. When opportunities arise as they have recently for obtaining certain sup-

plies without reimbursement or allocation to any activity," the physician and appropriate subordinates can use some "business sense" in improving and modernizing inventory within the limits prescribed by current directives and requisition objectives.

The Daily Journal of the Medical Officer The Manual calls for the maintenance of a log "in which shall be entered a complete, concise record of pertinent matters within the purview of the Medical Department." This log can be kept in a very routine and lackadaisical manner, or be made a valuable record of the daily "goings on." We have attempted to make our journal a record of binnacle and sick listings, receipt and detachment of health records, inspections, ambulance movements, lectures, meetings, and courses given or attended. The journal tells about the leave time of our personnel, medical supplies received, administrative and collateral duties of the physician, narcotic inventories, medical and laboratory reports, night and weekend activity, group and special physical examinations, fire drills, medical cases of unusual interest, and all special emergencies and conditions in the compound. Included also are projects within the department, important visitors, commendations and criticisms, and visits to other naval activities by our personnel. Even printed or pictorial matter of pertinent interest which does not interfere with the continuity of the log or lend to sloppy appearance is appended from time to time. The admiral is able to survey our activity at any time by checking this "department diary."

GENERAL MEDICAL DUTIES

Sick Call Probably one of the best known butts of joking and ribbing is the good old "sick call." This is great meat for those who are prone to point out the gross inadequacies of industrial, company, or Federal medicine. And yet, if one but pauses a moment, it is apparent that sick call need not be any lower in the scale of good medical practice than are private office calls. Sick call to our way of thinking is a most intriguing and stimulating experience. It is identical to general practice. Available is the equipment, the ready hand of the nurse and corpsman, the laboratory, and the private cubicle. The opportunity to practice high grade diagnostics and therapeutics at the dispensary level is limited by only two factors—time and interest. At the present time iatrogenic disease is being recognized, and the medical officer must examine himself objectively for evidence of over sympathy, hostility, and the utterance of rash statements. Treatment of mild psychoneurotic disorders does not represent a difficult psychiatric problem, and therapy should be prompt, symptomatic, and superficial. Any attempt at deeper therapy, however,

will result in being swamped with much of the emotional unhappiness of the activity and when there are hundreds of persons all too willing to open up their hearts to a patient audience and a sympathetic ear a great deal of unhappiness is involved—too much for the facilities of an industrial dispensary. A compromise between too much and too little care is only possible in a command where the senior officers have insight into our problems. Our philosophy is reflected by the statement of the admiral who at a recent conference stated that. In a business such as we are in [supply] 80 percent of our assets are people and people are persons. Each person is a personality and has to be considered in a personal way.

Dependent Care This is the most controversial and sensitive medical care issue in the armed services today. At this writing despite the ill-defined and fluid areas of responsibility a large part of the total work load of an industrial dispensary can be dependent care. This depends of course on the number of resident military in the area. At present the amount of this care is a compromise between the command and the medical officer and friendly haggling and stickling does occur. Diplomacy tact and the art of medicine are factors of paramount importance in supplying this care within the limits of the facilities available. Very recently dependent care in the Philadelphia area was greatly curtailed mainly at the naval hospital. The outlying dispensary must reassess how much or how little it is prepared to do and yet co-operate always with those who have medical problems. The implications are obvious.

When care is provided however the physician can gain much experience in both office and house call techniques while treating patients of all ages with every complaint from accidental injury to communicable disease. Just as some activities to save time and personnel have instituted the appointment plan in lieu of all-day sick call we attempt to use an appointment method for dependents. At one military hospital a dependent separation letter explaining the medical facts about the period of confinement has been prepared and is given to the patient to present at future stations. We have kept medical records on dependents and very frequently give them memos of their illnesses to present at the next station. As for the general problem it is sufficiently great as to have been the subject of one of Dr. Casberg's monthly messages.

Medical Coverage Medical coverage is as important in military medicine as it is in civilian practice. Almost all personnel are in a strange town or city and do not have the support of families and friends. When emergencies occur the medical personnel of

the area are called upon to give a command a diagnosis on level 1- often gives it both a diagnosis and a recommendation. This is part of a moral reaction which may or may not be precipitated by those outside the service or even by those receiving treatment but which should be considered by the physician as a response.

Physical Examinations. At the level of the service center command, the physician in passing on qualifications is called upon to make use of all Civil Service regulations and must exercise judgment on such examinations as those for enlisted workers, warehousemen, military animals, promotions, retirement, disability and hazardous and high duty. He must also co-ordinate all such physicals with the aviation surgeon.

INDUSTRIAL HEALTH AND SANITATION

Sick Leave. In industry there is a relatively small number of people, who, for one reason or another are responsible for accidents, absenteeism, tardiness, alcoholism, low turnover and inferior morale. The physician with some knowledge of industrial psychiatry will be able to ferret out the cause, prescribe remedies, and counsel to prevent a few from lowering the morale of the group. Sick leave investigation and correction presents an opportunity to serve the command in a unique capacity as a "medical detective." By recourse to civilian physicians, pharmacies, reports of visitors, friends and relatives, the course of illness can be tracked down and fair judgment made. Again tact, diplomacy, and the ability to think lucidly and speak quietly and effectively are important assets in this work.

Industrial Medical Research. With the exception of sick call this area of dispensary activity has proved to be the most fascinating. This is not basic research but rather research on a practical, clinical level. The command may have questions concerning almost anything from urinalysis to paint fumes, and answers are expected promptly. The ability to analyze, synthesize, and decide without being involved in litigation is of cardinal importance.

Blood Donor Campaign. When out in the field, accepting blood donation, the medical officer comes to realize the prominent role he plays in this program. Various duties are connected with this important work. The physician may find himself assisting the American Red Cross Blood Section, or he may assist in the collection of 5,000 persons using donations from a unit of people, publicly congratulating the members of the "donation club," or assisting the Red Cross team in the actual operation of transfusing. All this is as important as the scientific study of blood, and the research upon it.

COMMENTS

Industrial dispensary medicine is complex and the average physician fresh from internship or residency after many cloistered years in school is neither technically trained nor selected to maintain interest in the wide variety of nontherapeutic problems it presents. And yet this interest and intellectual curiosity is the mark of the well rounded scientist and physician.

Sir William Osler was not solely an outstanding diagnostician. His insight and understanding ranged the entire gamut of human thought and endeavor. As long ago as 1894 he recognized that the average medical school could hardly be expected to equip army surgeons with the full details of special training.¹ And military medicine was far simpler then. He also recognized the advantages of military medical service which are often interpreted by our contemporary doctor-draftees as insufferable burdens. He described the advantage of changing residence, the privilege of acquaintance with men of varied capabilities and training, and the self-reliance demanded by isolated medical practice, emphasizing that isolation often breeds originality.

Many of the physicians who are called into the services as a result of Public Law 779 are likely to have a sense of frustration and hostility toward the military. In the words of Churchill, "the moment a doctor gives way to frustration and reacts emotionally, he can see nothing good in the service and becomes resentful toward it. If these physicians can be stimulated to think about military service on an intellectual rather than an emotional basis, we will have done our best to develop an immediately effective member of the team."²

SUMMARY

1 The naval dispensary is an important area of general practice in the Naval Establishment. The naval industrial dispensary is even more important, as it includes broad aspects of industrial and nontherapeutic medicine as well as clinical practice.

2 Industrial dispensary medicine vies in importance and complexity with the more striking and more publicized specialties of amphibious, aviation, submarine, research and naval hospital medicine.

3 Medical officers considered for independent duty at such dispensaries should whenever possible be chosen from those who have had some prior experience or training in industrial psychiatry, occupational medicine or the various administrative fields. In order to render rapid decisions they should be able to analyze heterogeneous data in close coordination with other

departments Qualities of independent and adaptable leadership are desirable traits

4 Specialty training in internal medicine, psychiatry or public health, and preventive medicine are preferred prerequisites for this form of duty

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LET PATIENT TALK?

Students frequently are advised to let the patients talk. This, however, can be permitted only to a very limited degree. It has also been said that if patients talk enough they will talk themselves into a diagnosis. This rarely occurs; usually the patient talks himself out of a diagnosis chiefly by confusing the examiner and by not keeping interrogation and conversation along channels which may offer information. Certainly the immature student will become hopelessly confused by letting patients talk aimlessly. It requires tact, discretion, judgment, and experience to shut off those who aimlessly wander relating irrelevant details. Nevertheless, some patients must be encouraged to talk.

—FRIEDRICH W NIEHAUS M D
in *Postgraduate Medicine*
p 375 April 1954

THE INTERSTATE MILK SHIPPERS PROGRAM

An Aid to Milk Sanitation in the Armed Services

LOUIS R KAUFMAN *Lieutenant Colonel (MSC) USN*

THOSE in the armed services responsible for the sanitary control of dairy products delivered to military activities are constantly faced with the difficult task of determining the source and quality of the milk used in the preparation of these products. This is particularly true when a dairyman supplements his supply with raw milk procured from distant areas for then it is not always possible to conduct the important source inspections. The great distances that must be traveled, the amount of time and expense required to visit the farms, and the shortage of experienced personnel pose serious handicaps for the inspecting service. Experience has shown that in determining overall quality it is not practical to rely solely on examination of the raw milk (as delivered to the pasteurization plant) or of the finished products (as delivered to processing activity) because many methods can be used to successfully sophisticate an inferior product. It is therefore essential that reliable information be obtained regarding the background of these supplies whenever field inspections cannot be made. An excellent source of this kind of information is the U S Public Health Service publication *Sanitation Compliance Ratings of Interstate Milk Shippers*.

This quarterly publication lists the sanitation compliance ratings of those participating in the Interstate Milk Shippers Program under five headings: raw milk supplies, receiving stations, pasteurization plants, pasteurized milk, and sanitation enforcement ratings, each with a numerical score. These scores are made by an official state survey officer who bases his inspection on the milk ordinance and code recommended by the U S Public Health Service. If a dairy intends to sell only raw milk, the inspection is limited to that phase of the code dealing with the producer farms and the receiving stations.

DEVELOPMENT OF THE PROGRAM

Early in 1950 a national conference of Federal, State, and local milk regulatory bodies was held in St. Louis, and methods

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An Aid to Milk Sanitation in the Armed Services

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THOSE in the armed services responsible for the sanitary control of dairy products delivered to military activities are constantly faced with the difficult task of determining the source and quality of the milk used in the preparation of these products. This is particularly true when a dairyman supplements his supply with raw milk procured from distant areas for then it is not always possible to conduct the important source inspections. The great distances that must be traveled, the amount of time and expense required to visit the farms, and the shortage of experienced personnel pose serious handicaps for the inspecting service. Experience has shown that in determining over all quality it is not practical to rely solely on examination of the raw milk (as delivered to the pasteurization plant) or of the finished products (as delivered to processing activity) because many methods can be used to successfully sophisticate an inferior product. It is therefore essential that reliable information be obtained regarding the background of these supplies whenever field inspections cannot be made. An excellent source of this kind of information is the U S Public Health Service publication *Sanitation Compliance Ratings of Interstate Milk Shippers*.

This quarterly publication lists the sanitation compliance ratings of those participating in the Interstate Milk Shippers Program under five headings: raw milk supplies, receiving stations, pasteurization plants, pasteurized milk, and sanitation enforcement ratings, each with a numerical score. These scores are made by an official state survey officer who bases his inspection on the milk ordinance and code recommended by the U S Public Health Service. If a dairy intends to sell only raw milk, the inspection is limited to that phase of the code dealing with the producer farms and the receiving stations.

DEVELOPMENT OF THE PROGRAM

Early in 1950 a national conference of Federal, State, and local milk regulatory bodies was held in St. Louis, and methods

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The program is also useful to the official responsible for classifying and approving dairies to sell products to military activities. According to current procedures milk is classified into one of three groups: Number 1, Number 2, or Number 3. Federal Specification C M 381e, the quality guide for general mess milk, specifies that Number 1 milk (milk produced in localities having and enforcing the milk ordinance and code recommended by the USPHS and equivalent to Grade A) must be purchased when it is available in adequate quantities. This definition is complicated by the fact that the specification permits milk from localities not following the USPHS recommended code to be classified as Number 1, provided it is of a quality equal to that produced under the code.

The problem of determining whether a dairy will qualify under the "equal quality" clause rests with the classification official. Again the Interstate Milk Shippers Program is helpful. Because the requirements to qualify as Number 1 milk are essentially the same as those necessary for a dairy to participate in the program, it can be assumed with reasonable assurance that a dairy participating in the program and having a pasteurized milk rating of 90 percent or better can provide Number 1 milk. Frank and associates' stated " * * a pasteurized milk rating * * does mean that the pasteurized milk supplies in general of the community in question are as safe as a reasonably strict enforcement of the milk ordinance recommended by the Public Health Service will make them. Citizens who limit their purchases of milk to Grade A pasteurized milk secured from communities with 90 percent ratings may, for all practical purposes, ignore the danger of milk borne infection."

It is important, however, that the sanitation enforcement rating reported be given careful consideration. A dairy should not be classified Number 1 if the sanitation enforcement by the local health authorities is not adequate to maintain the high ratings reported on the Interstate Milk Shippers List.

Dairymen who simultaneously serve several large installations occasionally find themselves with an insufficient raw milk supply for their needs. This situation usually is of concern to military officials responsible for the sanitation of dairy products for it means that these milk contractors often must procure an added supply, the source and quality of which is not always completely known. As mentioned above it is not feasible for the military inspector to investigate each individual source, and it is possible that Number 2 or Number 3 milk could be mixed with and sold as Number 1. Since the development of the Interstate Milk Shippers Program procurement of additional milk no longer should be a problem. A source of information is available where by the contractor can locate other dairymen willing to sell milk.

REACTION OF TROOP COMMANDERS TO A MENTAL HYGIENE CONSULTATION SERVICE

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MENNINGER¹ drew attention to the poverty of communication between the psychiatric service and "the line" prior to World War II. War brought with it increasing recognition of the severity and complexity of the military neuropsychiatric problem.¹⁻³ One result of this awareness was an expansion of neuropsychiatric services for the purpose of preventing manpower loss due to psychiatric casualties. More and more the military medical service began to stress prevention of these losses by early active intervention and alertness to possible future psychiatric problems.³⁻⁶

Started in 1942 at Fort Monmouth, N. J., the mental hygiene consultation service is a recent organizational aspect of the Medical Corps' struggle to solve neuropsychiatric problems. By 1945 there were 36 such facilities in various military stations, attached usually to training centers or divisions.⁶ A mental hygiene consultation service differs from a formal neuropsychiatric clinic in a hospital in that it is not primarily a clinic; its first function is prevention rather than cure. Of necessity the scope of action of the psychiatrist in the mental hygiene consultation service is broader than in the neuropsychiatric clinic. In the latter the psychiatrist's interest is restricted to his patients' referrals and consultations.⁷ In a mental hygiene consultation service the main activity must be educational orientation toward the problems of the leader as well as those of the recruit. Here the psychiatrist must observe, judge, advise, support, correct, encourage, remove the unfit, and salvage the desirable, all for the purpose of assisting unit commanders in dealing with soldiers who have adjustment problems.

Troop commanders, after learning of the manpower saving potential and the philosophy of the psychiatrist in the mental hygiene consultation service, were quick to welcome such facilities in their attempts to produce and maintain a well trained, effective military force. The psychiatrist and troop commander began to understand each other. The former began to think in terms of the problems facing a military leader and to modify his

technical language in order to communicate his concepts more clearly. He considered unit morale and effectiveness rather than restricting his attention to the problem of the individual soldier. The commander on the other hand learned to appraise the psychiatric problems of his men in more realistic ways to make use of problem soldiers more effectively and to avoid situations which would result in unnecessary mental stress for his troops.

Published reports² have indicated the value of the mental hygiene consultation service plan. Criteria generally used to examine effectiveness of the program are absent-without-leave and venereal disease rates, frequency of courts martial, and the number of men hospitalized for neuropsychiatric observation. We believe that there is another less objective but equally meaningful criterion for determining effectiveness of a facility which practices preventive psychiatry. This is the commanders' reaction to the mental hygiene consultation service. That is, in what ways have the troop commanders been influenced by the mental hygiene consultation service, and what are their feelings about the facility in their unit?

MATERIAL AND METHOD

During the course of the study conducted at this facility 62 officers most closely identified with policymaking (the commandant and his staff) and troop control (company, battalion and group commanders) were interviewed in order to obtain their opinions about the mental hygiene consultation service. The answers to the questions asked in personal interviews ranged from a few words to a 30 minute discussion.

RESULTS

The four specific questions asked and the answers obtained are enumerated below. The figures in parentheses represent the percentage of interviewees who included this answer in their response. The investigators arrived at these percentages by interpreting and classifying the interviewees' spontaneous replies. Interviewees frequently gave more than one answer to each question. Some did not answer one or two questions.

What value has been obtained from the mental hygiene consultation service to the commandant?

1. It educates officers and enlisted cadre in how to recognize the sick and how to effectively use the mentally handicapped (68 percent).
2. It provides prompt action when assistance is requested by the troop commander (32 percent).
3. It eliminates the unfit and the unsalvageable soldier (13 percent).

4 The psychiatrist provides a liaison between commanders and the nearest hospital facility (10 percent)

In what ways has the mental hygiene consultation service helped you specifically?

1 It provides early treatment and rehabilitation of trainees (41 percent) The Director of Personnel of the Engineer Replacement Training Center reported that from 60 to 65 percent of "problem trainees" were salvaged by the mental hygiene consultation service who would otherwise have been separated from service

2 It advises concerning effective classification and assignment of personnel (24 percent)

3 It assists at courts martial command investigations and boards convened under Army regulations 615 36C (15 3CS 615 369 and (00-443 (19 percent)

4 It offers lectures and informal conferences on mental health topics of interest to commanders (19 percent)

5 It is helpful to the inexperienced commander in handling suicidal risks and in differentiating between the sick soldier and the malingerer (18 percent)

Has the mental hygiene consultation service ever hindered you from performing your job in the way you considered most effective? Has it ever failed to meet your needs?

1 It could provide more assistance during stressful periods in training such as rifle range close combat course and infiltration course where professional observation and recommendation can be of immediate aid (27 percent)

2 It is sometimes too lenient with problem soldiers (16 percent)

3 Occasionally in critical cases of problem soldiers it delays decisive action too long (13 percent)

4 Recommendations for clinical treatment are not always clearly expressed More uniform and consistent follow up by the service is desirable (eight percent)

5 Army leaders need more information concerning its mission function potential contribution and limitations (five percent)

Can you suggest improvements in the function of the mental hygiene consultation service?

1 It should help teach the less experienced unit commanders how to use psychiatric counsel and assistance Junior officers and noncommissioned officers should have lectures or other form of education in understanding the problem soldier (2 percent)

2. Its staff need to pursue more vigorous program of professional support to include daily contact with each training company in the field if possible (27 percent)

3. The psychiatrist should familiarize himself more with the problems of the commanders and trainees (18 percent)

4. It should devise tests and surveys to aid in the early discovery of potential problem trainees (eight percent)

COMMENT

The majority of commanders interviewed considered the mental hygiene consultation service a promptness in answering a request for help one of its most valuable features. The psychiatrist and his staff arranged to examine referred soldiers within 24 hours of referral in order to initiate effective help as soon as possible. The commanders were interested in learning how to deal with the problem soldiers. The mental hygiene consultation service often received requests for information on specific methods of handling certain trainees. The leaders valued the action of the psychiatrist in eliminating the unfit and unallevageable soldiers who required a disproportionate amount of attention from officers and cadre and usually lowered group morale.

The mental hygiene consultation service psychiatrist provided a liaison between the station hospital and the training center. He presented the problems of the troop commander to the physicians providing medical treatment for trainees in the hospital and he explained to the commanders the nature and purpose of medical limitations for trainees.

Officers responsible for classification and assignment welcomed the help of the mental hygiene consultation service staff. At courts martial and investigations the psychiatrist acted as a working member of an administrative team. Commanders were thus more ready to consider the psychiatrist not only a physician who treated patients but also a specialist collaborating with other specialists in support of the group mission.

A useful service was the support and comfort the mental hygiene consultation service gave to leaders who became anxious when confronted by soldiers with the dramatic symptoms of a major hysteria, grand mal epilepsy, suicidal gesture, et cetera.

To help them handle panic reactions among some trainees, the troop commanders desired more assistance at certain training periods during which combat conditions were realistically simulated.

Leaders have a realistic fear that an epidemic of malingering will result if a trainee can use the medical service in order to avoid duty. Doubtless such situations sometimes occurred; the mental hygiene consultation service received evidence of them in

increased referrals of soldiers with vague complaints. On the other hand, those patients for whom certain permissive measures were recommended nearly always justified such treatment by showing improvement in their condition. In general, our recommendations did not include a lessening of the hardships of duty unless we believed it was necessary for the rehabilitation of an otherwise useless soldier.

We considered it part of the psychiatrist's duty to inform the leaders of how he can contribute to the efficiency of their units, to delineate the function of the mental hygiene consultation service, and to define the various forms of neuropsychiatric problems which may arise. A lack of understanding by troop commanders of the function of the psychiatrist may sometimes make them suspicious of the value of his service.

Personnel on the mental hygiene consultation service believe that all except psychotic trainees should be given a suitable trial of duty. The early discovery of potentially maladjusted soldiers will not be made until those noncommissioned officers who are directly concerned with training are able to recognize the danger signals of impending trouble. Furthermore, the psychiatrist cannot predict the eventual success or failure of the performance of many borderline patients because he does not know every trainee's future job assignment or who his leaders will be.

SUMMARY

We have recorded the opinions and reactions of a group of troop commanders. Generally these officers expressed much appreciation for the mental hygiene consultation service within their command. It behooves a supporting facility such as this service carefully to consider the impressions of the troop commanders because, for practical purposes, the actual value of a psychiatric facility is in direct ratio to what commanders consider its value to be. Through such a study the mental hygiene consultation service has had the opportunity to examine its errors of omission or commission, to correct misinterpretations, and to advance in those areas where the commanders wanted further psychiatric help.

CONCLUSIONS

This study reveals certain basic beliefs among command officers concerning the operation of a mental hygiene consultation service in this training center. It is considered that the following points have application to other military installations.

- 1 This service simplifies, mitigates, and reduces the neuropsychiatric problem in the Army.

- 2 Its functions are still not as well known to the troop commanders as they should be; consequently this facility is not yet completely integrated into the command.

3 Its operations tend to go beyond strict doctor patient relationships and to become concerned with the mental hygiene aspects of the total situation

4 Promptness of the service's action is appreciated

5 The facility is a source of comfort to commanders in dealing with the problem soldier

6 There is a tendency on the part of some officers to overestimate the abilities or the role of the psychiatrist

7 Specific treatment recommendations are sometimes considered "mollycoddling"

8 There is a general desire for more active participation by the psychiatrist in the training program

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MODIFIED SPRUE DIET FOR ULCERATIVE COLITIS

The approach to the treatment of chronic ulcerative colitis is enhanced with omeprazole treatments and corticosteroids. It is too hopeful that the observations derived in this paper are presented humbly with the hope that this type of management will open new avenues to an ultimate conquest of this dreadful disease. The results reached in our study embrace the period of the past three years when a number of our chronic ulcerative colitis patients had relapsed in desperation when all of the established methods of therapy such as trimethoprim-sulfamethoxazole, ACTH and corticosteroids failed. Modified sprue diet was instituted. The improvement was dramatic and followed within 48 hours to four days after starting the specific diet.

—HENRY A. MONAT, M.D.

Am J nat / G t cent l gy

p 197 Ma 1954

Dermatitis Following Topical Application of Antihistamine Preparations

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WHEN antihistamine drugs first came into use, it was hoped that they would be the "cure all" for various allergic disorders. They did provide temporary and dramatic relief in many instances to sufferers from allergic rhinitis, bronchial asthma, urticaria, and other allergic manifestations. With the discovery of new antihistamines of different chemical natures even more active compounds with less side effects were made available. Initial enthusiasm and glowing reports of their value soon appeared in the medical literature. After almost a decade of use, it is clear that their value as topical agents has lessened considerably. They have cured very few patients with dermatologic disease, if the cause was not removed, but have served some usefulness in the relief of pruritus.

With ubiquitous and voluminous usage of any drug for a considerable time, allergic reactions are prone to occur in a certain percentage of persons, as is seen in the rapidly increasing rate of penicillin reactions.¹

It is well known that the topical route is one of the most effective methods of producing allergic sensitivity to a drug. It is recalled that this problem previously arose in connection with the topical use of sulfonamides and penicillin. This led to the withdrawal of the acceptance of topical forms of these anti-infective agents because their therapeutic value is outweighed by the high incidence of sensitivity reactions, and because they are effective against local infections when administered systemically. Subsequently, sulfonamides² and, later, penicillin³ preparations to be used topically were deleted as acceptable dermatological preparations from the American Medical Association's *New and Nonofficial Remedies*.

The antihistamines are gradually becoming common skin sensitizers. Nomland⁴ stated that the antihistamines used locally are second among cutaneous sensitizers. Numerous cases of contact dermatitis have appeared following the application of antihistamine creams.⁵ Usually the patients have applied the preparation

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periodically for several years in an attempt to control pruritus associated with various dermatoses

Based on the opinion and experience of leading dermatologists the Council on Pharmacy and Chemistry American Medical Association concluded that the risk of contact dermatitis now over shadows the efficacy of the topical use of antihistamine drugs *



Figure 1 Acute contact dermatitis of the perianal region following application of two percent piperazine hydrochloride water-soluble ointment

Other time honored preparations are valuable and effective antipruritics and rarely sensitize. These include medicated baths,* colloid oatmeal or tar and the use of antipruritics such as menthol chloral hydrate camphor liquor carbonis detergens calamine and witch hazel in lotions emulsions ointments and pastes. There also are a few proprietary antipruritic creams that are low sensitizers.

The following three case histories are cited as typical examples

CASE REPORTS

Case 1 A 40 year old woman was observed with the chief complaint of an acute dermatitis of five days duration. For many

years she had experienced severe episodes of pruritus of the perianal region. In order to obtain relief she had applied various antipruritic ointments. Antihistamine creams, when originally used, provided considerable relief. With the onset of the latest episode, two percent tripeleonnamine hydrochloride in a water soluble ointment base was applied. Within 24 hours there was marked burning with the development of typical acute contact dermatitis. The dermatosis was cleared with soothing dermatological preparations. After one week, a patch test with two per

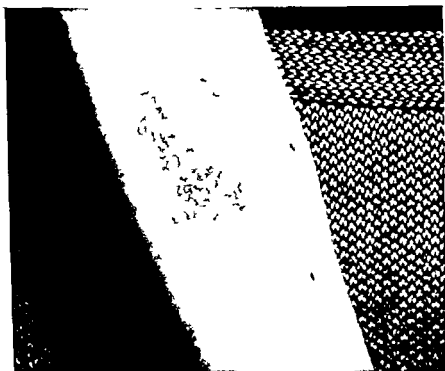


Figure 2. Site of patch test on right forearm 48 hours after application of two percent tripeleonnamine hydrochloride in a water soluble ointment base.

cent tripeleonnamine hydrochloride in water soluble ointment base was made on the left forearm. The control with water soluble ointment base was performed simultaneously. Within 48 hours there was marked redness and vesiculation at the site of the patch test with the antihistamine, while the control showed no reaction. These findings confirmed our suspicion of an allergic eczematoid type of contact dermatitis due to the antihistamine (fig. 1).

Case 2 This 38 year-old woman entered the dermatology clinic with a chronic lichenoid dermatosis of the left upper eyelid. She gave a history of being given an antihistamine ointment by another physician for recurrent pruritus of the eyelid. A few hours after the application of the preparation there was marked itching and spreading of acute dermatitis over the entire face. This dermatitis subsided spontaneously within a few days with soothing

therapy. A patch test with two percent tripeleennamine on the forearm revealed a four plus reaction within 48 hours the control was negative (fig. 2).

Case 3. A 38 year-old woman was observed with acute dermatitis of the palmar aspect of hands and fingers of several days duration. She had experienced recurrent attacks of a dyshidrosis associated with moderate pruritus for several years and had applied an antihistamine cream to relieve the pruritus. Patch tests confirmed the clinical impression of contact dermatitis due to two percent tripeleennamine in a water soluble ointment base (fig. 3).

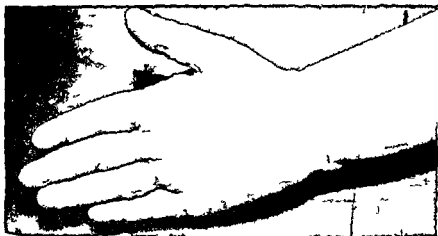


Figure 3. Contact dermatitis of the palmar aspect of the right hand and ulnar aspect of the forearm following topical application of two percent tripeleennamine hydrochloride in a water soluble ointment base.

In addition, we have observed a few cases of generalized urticaria from oral ingestion of diphenhydramine hydrochloride capsules and tripeleennamine hydrochloride tablets.

SUMMARY AND CONCLUSIONS

Allergic reactions from antihistamines are progressively increasing. These agents should be considered in determining causes of allergic eczematoid type of skin eruptions. The risk of cutaneous sensitivity from topical antihistamines outweighs their value as antipruritics, and it is recommended that their use be greatly curtailed. Many other antipruritic preparations are as effective and rarely produce sensitization.

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ANTIBIOTICS FOR EVERYONE?

Physicians to a greater extent than any persons know of the impact of antimicrobial therapy on the practice of medicine and the natural history of infectious disease. Even they are not fully aware of the enormous quantities of these agents that are used in the United States each year. Penicillin is now being manufactured at a rate of well over 300 tons per annum—equivalent to 150 million courses of three million units each year. More than 100 tons of streptomycin are made, which would permit the administration of 100 million 1 gram doses of this agent. The broad spectrum drugs are also produced in enormous quantities. It is believed that the rate is not less than 250 tons per annum. This is enough to permit the administration of 25 million 10 gram courses each year. Information is not readily obtained as to the production of the other less widely used antimicrobial agents, but it is substantial. Exact figures are not available, but it may be readily calculated that more than half a billion dollars a year is spent by patients for these drugs. It is apparent from these data that few Americans can escape treatment with antibiotics for any length of time.

—LOWELL A. RANTZ, M.D.
in *California Medicine*
p. 1, July 1954.

Ectopic Opening of Ureter Into Seminal Vesicle

With Hydro Ureter and Atrophic Hydroureter

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WAYNE A CLINE M D

ECTOPIC insertions of ureters into seminal vesicles are sufficiently uncommon to merit reporting. In 1950 Hamilton and Peyton were able to find only six previously recorded instances diagnosed clinically and they reported a seventh. Pasquier and Blomack reported an eighth in 1953 and to the best of our knowledge the case presented below is the ninth. Hamilton and Peyton gave an adequate discussion of the underlying embryologic defect.

CASE REPORT

A 26-year old man was evacuated to this hospital from the 11th Evacuation Hospital on 12 December 1952 with a known ectopic insertion of the left ureter into the left seminal vesicle. The patient had originally been hospitalized at the referring institution because of recurring episodes of left back pain for three years, sexual orgasms unaccompanied by a visible ejaculation for one year and difficulty in voiding and nocturia for one month. A large, sacculated, flabby left seminal vesicle had been found rectally while excretory urograms demonstrated a normal right kidney but no evidence of a functioning kidney on the left. At cystoscopy the right ureter and trigone were found to be normal in appearance and location but the left side of the trigone and the ureteral orifice were absent. An opening in the prostatic urethra into the left seminal vesicle was found through which a ureteropyelogram was done (fig. 1).

Physical examination at this hospital was essentially negative save for the rectal findings previously described. Urinalysis, blood count, blood urea nitrogen, sedimentation rate, total protein and albumin-globulin ratio were all within normal limits. The patient was recystoscoped on 17 December 1952. Just distal to the verumontanum was a large, trap-doorlike opening which readily admitted the beak of a 24 sheath pan endoscope revealing a smooth-lined, glistening cavity about

3 by 2 by 2 centimeters. The opening of neither vas nor ureter could be seen. The ureteropyelogram was repeated. Right retrograde pyelograms were normal.



Figure 1 Retrograde pyelogram showing catheter coiled in seminal vesicle and dilated ureter

On 22 December 1952 under general anesthesia a left nephroureterectomy was done through a lumbar approach. The left renal fossa was empty but opposite the second lumbar vertebra was a globoid mass 9 by 7 by 6 centimeters which terminated in a thick cordlike structure with the same circumference as the descending colon. The ureter was adherent to the lateral surface of the colon as far as the pelvic floor at which point it crossed the bowel ran behind the bladder and it could be determined digitally ended in the seminal vesicle. The last viscus was apparently in its usual anatomic site. No definite renal pedicle was identified. Without extending the original incision anteriorly it was possible to dissect the entire ureter free and all but about 15 centimeters of the terminal ureter was removed (fig. 2).

Convalescence was uneventful. The patient's temperature rose to 100.4 F the evening after the operation but he was afebrile thereafter. At about 1200 hours the first postoperative day the patient developed a productive cough followed at about 1800 hours by signs of a right-sided atelectasis. Shortly thereafter he brought up a large mucous plug and his chest signs disappeared promptly.



Fig 2 Surgical specimen showing hydronephrotic kidney

The patient left on a week's convalescent leave on 5 January 1953 (the fourteenth postoperative day). Upon his return he stated he had had normal sexual relations again and no urinary difficulties. The left seminal vesicle was questionably palpable. He was cystoscoped on 15 January 1953 and the opening into the left seminal vesicle was no longer demonstrable. The patient was returned to duty on 19 January 1953. When last heard from he considered himself well.

Histologically there was no evidence of functioning renal parenchyma in the walls of the hydronephrotic kidney.

COMMENT

The case history presented here differed from those of Hamilton and Peyton and Pasquier and Womack in that the seminal vesicle was in its normal position, opened into the prostatic urethra and did not intrude into the bladder lumen. Further

more, the surgical management did not include vesiculectomy and excision of the terminal segment of the ureter. This was originally contemplated, but in view of the ease in removing the bulk of the ureter and the adequate drainage of the vesicle, it was believed at operation that additional surgical procedures were not merited. The decision proved valid.

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TRENDS IN GENERAL PRACTICE

The loyalty of the worthwhile patient who comes to the family doctor no matter from what distance and who waits patiently for the doctor and friend when it becomes necessary for him to come to the home is one of the most satisfying aspects in the practice of medicine. Questions asked of a large number of doctors in various age groups elicited the information that those in practice from 20 to 30 years or longer enjoyed the loyalty and continuing dependence on them of the great majority of their patients. From younger groups questioned came the rather startling statements that the yearly change in their patient roster ran as high as 60 percent with an average of 35 percent. Such figures would seem to indicate something lacking in the attitude of the younger physicians. Does the answer to the question implied by these figures lie in the fact that current medical education is turning out scientists rather than doctors and that the younger physicians as often charged are treating diseases rather than people? Are they failing to strive to become the friendly always welcome family doctor who is an intimate integral part of American life? If they are they are failing to achieve the most satisfying compensation in a life dedicated to medicine.

—Editorial

in Medical Annals of the District of Columbia
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Ehlers Danlos Syndrome

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THE Ehlers-Danlos syndrome of hyporelasticity of the skin hyperextensibility of the joints and fragility of the skin and blood vessels represents an inherited, constitutional dyscrasia of the mesenchyma. Described primarily in the pediatric and dermatologic literature this disorder is of importance to the military surgeon because those persons so afflicted may become unsuitable for service. A thorough and complete review of the topic may be found in the report of Johnson and Falls.

CLINICAL SIGNS

Arthrochalasia or exaggerated laxity and mobility of the joints may be of such degree as to cause inability to walk during childhood. Instability of the knees and ankles, markedly flat feet, and recurrent dislocation of the shoulder may interfere with physical activity in adult life. Evidence of extreme degrees of double jointedness may be found in the fingers and toes while instances of involvement of the temporomandibular joint, cervical vertebrae, sternoclavicular articulation and patella have also been recorded.

Examination of the skin reveals hyperlaxity and hyperelasticity (*dermatochalasis cutis*) particularly over the bony prominences such as the knees, elbows and shins. Folds of the skin may be pulled three or four inches off the bone and when released immediately retract to their normal position. In addition the skin may have a velvety texture.

The third manifestation of this syndrome is the pathologic fragility of the blood vessels and skin (*fragilitas et dermatorrhexis cutis*) resulting in easy bruising. Minor cuts or glancing blows may result in gaping wounds which have a tendency to elongate due to the elasticity of the skin. The surgeon may find that sutures tear out and that adhesive tape must be used to approximate the edges of the wound. In other instances though the skin may not be broken by the blow large hematomata develop. As a sequel to such injuries scars become numerous and prominent and leave the skin with a characteristic papyrus or paperlike texture. With

rare exceptions, studies of the clotting mechanism—bleeding, clotting, and prothrombin times, platelet counts, and serum calcium—have all been reported as normal, although the Rumpel Leede sign may be positive

Associated with the above three cardinal features of the Ehlers Danlos syndrome are two less constant findings. Over the bony prominences or over the Achilles tendon, molluscoid pseudotumors may result from partial reabsorption of hematomata. Due to repeated injury to these areas, the hematomata do not resolve

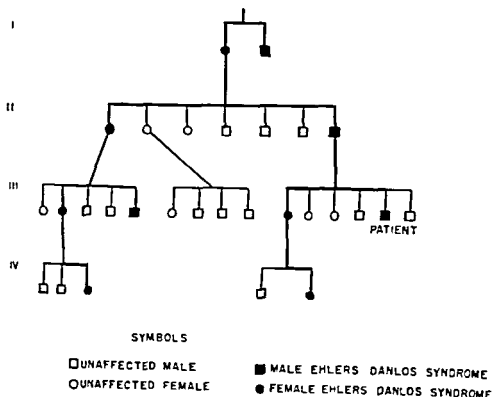


Figure 1 Genealogic tree of a family with Ehlers-Danlos syndrome.

between one injury and the next. Inflammation and infiltration occur, leaving raisinlike elevations of the skin. Weber and Aitken³ have stressed the presence of subcutaneous nodules as a fifth sign of the Ehlers Danlos syndrome. Unlike the pseudotumors, these cystlike nodules are located in areas which, although also prone to trauma, have moderate amounts of subcutaneous fat. The spherules are freely movable in the subcutaneous tissue and are from 3 to 5 mm in diameter. Calcification of the nodules may occur, causing changes visible on roentgenographic examination.⁴

Rossi and Angst⁴ have stressed the association of other congenital anomalies with this disorder and believe this association has a bearing on its cause.

PATHOLOGY

Pathologic studies^{1, 2} have demonstrated the epidermis to be normal except for wrinkling and mild atrophy. In the corium the elastic elements are present in increased amounts and show thickening of the elastic fibrils. The collagenous tissues have



Fig. 2. Diminished length of the pedicle.

been variously reported as increased and as diminished. The blood vessels, although unduly fragile, do not show changes on biopsy. A decrease in subcutaneous fat leaves the vessels with less than normal support. Weber and Aitken have demonstrated the subcutaneous nodules to consist of small budlike lobules of subcutaneous fat from which the pedicle has atrophied, leaving

the nodules freely movable. A thick fibrous capsule surrounds the fat cells, most of which are necrotic, and calcifications subsequently develop in these nodules. The histology of these pseudotumors has been described only scantily by Bolam* as describing cavernous angiomas, whereas it is noted that histologically one finds partially reabsorbed nodules plus masses of scar tissue.

The exact cause of this syndrome is not understood, and Falls have summarized the reports of familial cases. From their cases, as well as from the case to be presented below, it is suggested that this syndrome is inherited as a dominant transmission. The association with other



Figure 3. The loose skin lifted three inches off the patient's arm.

led Rossi and Angst to believe that the combination of features of dermatorrhexis cutis, dermatochalasis cutis, and arthrodislocation was merely part of another example of multiple congenital anomalies. The pathologic studies would indicate a dysplasia of the mesenchyma.

The following case study illustrates the import of this syndrome to the military surgeon, and is a further example of this dominant inherited disorder.

CASE REPORT

A 20-year-old soldier was admitted to the hospital for dental operation for evaluation of a history of easy bleeding.

From infancy the mildest of trauma resulted in lacerations or hematomata. His skin healed with residual scarring and discoloration particularly on the legs. He always had had extremely loose skin and had been markedly double-jointed. He had had no difficulty in learning to walk however and no tendency to excessive falling because of his hyperextensible joints although he had once broken his wrist.

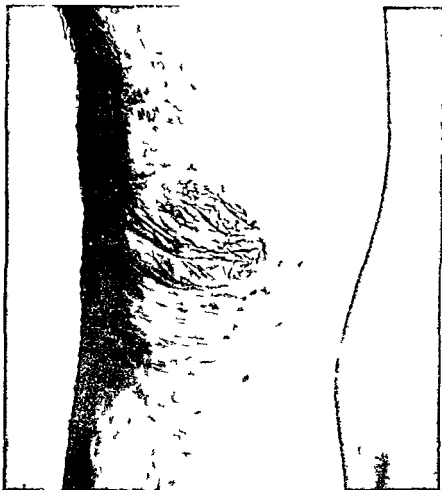


Fig. 4. Characteristic appearance of the skin (dermatitis) in the patient with Ehlers-Danlos syndrome (hyperextensible skin).

The patient's past history was otherwise not contributory and the review of the systems was unrevealing. He had not been born prematurely. Despite the presence of a pectus excavatum he was not short-winded and was able to play the bagpipe. The family was of Irish extraction and other members of his father's family has the same disorder (fig. 1).

The patient was of slight build but well developed, moderately well nourished, 69 1/2 inches tall and weighed 115 lbs. The skin was remarkably loose and elastic (fig 2) and could be drawn from 2 to 4 inches off the elbows, patella, and upon release would immediately snap back to normal (fig 3). To touch, the skin had a velvety, soft texture.

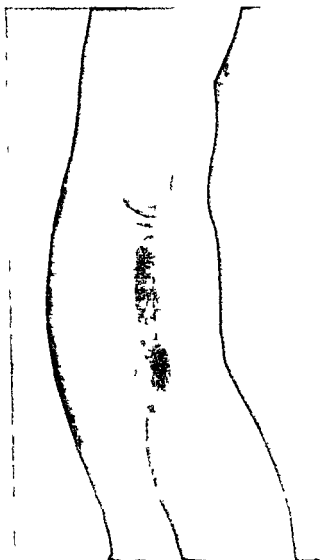


Fig. 5. View of the legs showing hyperextensibility (a throuchala) of the knees.

over the shins there were multiple paper thin, discolored nevi (fig 4). Several hematomata were present in the same area. No pseudotumors or subcutaneous nodules could be demonstrated.

Hyperextensibility of the joints was most marked in the fingers, wrists, elbows, knees, and toes. The fingers and wrists could easily be hyperextended until the fingernails rested on the floor.

arms. Similarly the toes could almost bend back onto the dorsum of the foot. Despite a moderately severe genu recurvatum (fig. 5) the legs were stable.

The remainder of the physical examination was not significant except for a moderate pectus excavatum and marked dental caries.

Laboratory findings were generally within normal limits except that clotting time was 18 minutes 30 seconds.

The patient was returned to full military duty. The rigors of basic training especially of the infiltration course however resulted in numerous lacerations and hematomata making him unfit for duty and he was discharged from military service.

SUMMARY

A case of the Ehlers Danlos syndrome with familial inheritance presented here illustrates the importance of this disorder to the military surgeon. Characterized by hyperextensible joints, hyperelastic skin, fragile skin and blood vessels, molluscoid pseudotumors and subcutaneous nodules, the syndrome may appear either with all the manifestations or as a partial form—*forme fruste*. It is suggested that the inheritance is by a dominant transmission.

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Allergy to milk is uncommon in infants and can be responsible for a variety of symptoms. At present it is being overemphasized. The milk-free infant formula is a definite and a valuable place in the treatment of some illnesses but they are being used altogether too much in many situations which have nothing whatever to do with milk allergy.

—F. m. d. l.

J. m. l. (Allergy) p. 474 Sept. 1953

Hazards of the Tin Can Ash Tray

BENJAMIN G. MUSSER, M.D.
H. CLINTON DAVIS, Captain MC USA
L. G. GLASSON, Captain MC USA

THAT the surgical repair of lacerations on the plantar surface of the foot may result in marked disability has been re-emphasized by our experiences in treating tin can lacerations. These injuries have been incurred by soldiers when accidentally stepping or jumping on tin cans placed on the floor of the barracks. Ordinarily, suitable receptacles for cigarette stubs are placed on the floor or are attached to posts or walls of the barracks. Occasionally, however, soldiers use empty C-ration or peanut cans as ash trays. These cans have a razor sharp edge and if inadvertently left on the floor at the side of the bed, are an accident hazard.

A similar injury to the palm of the hand was observed when a soldier fell out of his bed, striking his hand on a tin can on the floor. A search of the literature revealed no previously reported hand or foot injuries of this type.

Of the 10 patients presenting this injury who were observed within the past year, six had deep wounds requiring hospitalization and four had minor wounds successfully treated on an outpatient basis. Three of the patients required an extended period of hospitalization. The following cases are presented as typical examples of this kind of preventable accident.

CASE REPORTS

Case 1 This patient in jumping out of his bed in the barracks, stepped on a tin can on the floor and sustained a 10 cm laceration on the plantar surface of the left heel. This laceration was repaired in the outpatient department, and the patient was admitted to the hospital to prevent early ambulation. Because of poor skin approximation, his wound required revision. Postoperatively, the foot was immobilized with a plaster splint. After suture removal he was ambulated with a walking cast for three weeks. Subsequently a sponge-rubber insole was fitted into his shoe and he was returned to duty five months after injury; the incision remained sensitive to pressure for six months. At that time the midportion of the scar remained depressed (fig 1).

Case 2 This patient jumped from an upper bunk inadvertently stepping on a tin can. He sustained a curved seven centimeter laceration of the lateral margin of the foot which was repaired



Figur 1 (a 1) The maintained depressed five months injury

and treated on an outpatient basis. Because a wound infection ensued, he was admitted to the hospital 12 days later. The foot was treated by elevation, compresses, and systemic penicillin. Thirteen days later, serous drainage was still present. One month after injury (fig 2A), the wound was debrided and primarily closed, and the foot was immobilized with a plaster cast. Because of local pain and poor wound healing, weight could not be borne until three months after injury. He was returned to duty four and one half months after injury. At that time, the scar was sensitive to pressure and required a sponge insole for prolonged walking (fig 2B).

DISCUSSION

The foot presents unique problems in wound healing. In standing, the body weight is equally distributed to the heel and the forefoot. By far the greater part of the weight to the fore part of the foot is taken up by the first metatarsal. Weight is distributed

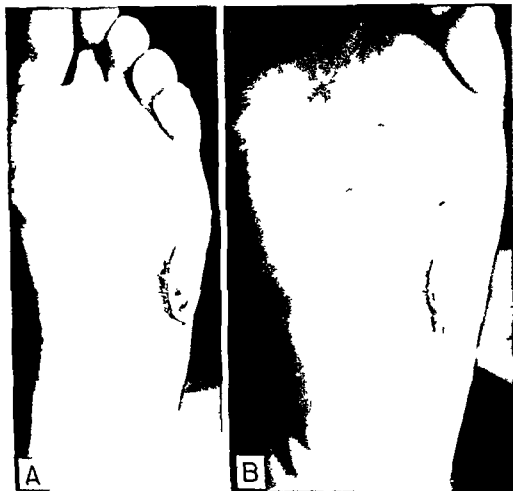


Figure 2 (case 2) (A) Poorly healing wound one month after injury (B) The wound 17 weeks after injury

over the lateral metatarsals for proper body balance. Consequently, poorly healed wounds over the first metatarsal area and over the heel more frequently result in prolonged disability.

The basic principles of wound healing must be strictly adhered to in the treatment of these injuries. Because many of these wounds have been deep, it would seem preferable for the repair to be done in the operating room. Local anesthesia has not been adequate for the cleansing and primary repairing of these wounds. Hemostasis must be absolute, fine catgut ligatures are preferred. The fascia and plantar muscles may be reapproximated

with interrupted sutures of fine chromic gut. Nonabsorbable suture material should not be buried in the weight-bearing surface of the foot. A suture granuloma in this area would be disabling. Interrupted fine-wire closure of the skin is used.

Immediately after repair the foot should be immobilized by a plaster splint or a cast. The foot must be in a neutral position with adequate support for the metatarsal heads. A cast, if applied, should be split on the dorsal surface to prevent circulatory embarrassment. Bed rest and elevation of the part is desirable. After removal of the sutures weight bearing to the incision should be delayed by the application of a cast and a walking iron. This may be removed in three weeks. A sponge insole in the shoe is advised when weight bearing might produce undue widening of the scar with resulting increased morbidity.

It is believed that medical personnel in the armed services should be aware of this problem. Because these injuries represent preventable accidents unit commanders can greatly eliminate this hazard by providing adequate ash receptacles with blunt or rolled edge.

SUMMARY

Presentation of a series of injuries incurred by inadvertently stepping on tin cans used for ash trays shows that meticulous wound closure and adequate immobilization is mandatory in the proper management of severe lacerations on the plantar surface of the foot. Early ambulation is condemned as painful scars have ensued. These preventable injuries are unique to the military services.

ROUTINE SIGMOIDOSCOPY

In spite of the emphasis that has been placed on the role of sigmoidoscopy in routine physical examination the physician too frequently assumes that he has completed an exacting study of the large bowel from anus to cecum by ordering barium enema or air-contrast study. Most roentgenologists today would agree that blind rectal inspection in the sigmoid and rectum during x-ray examination of the large bowel. The bony pelvis obscures detailed study of lesions in the rectal ampull.

—TIMOTHY A. LAMPHIER, M.D.

American Journal of Surgery

p. 207, August 1954

A Study of *Paracolobactrum Coliforme* Strains Isolated in the Far East

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ALICE KASE

PARACOLON organisms (*paracolobactrum*) attracted medical attention in the Far East after a review of statistics from this area revealed that most diarrheas of short duration in naval personnel exhibit no salmonella shigella, or *Endamoeba histolytica* and that slow lactose fermenting coliform organisms are frequently isolated from the feces of persons so afflicted. An investigation of *paracolobactrum* aboard naval vessels was first suggested. Later this study was extended to cover all such organisms received by this laboratory from Army and Air Force Laboratories in the Far East. A comparison of these organisms with similar strains obtained in Japan and Korea was also made.

Stuart and associates¹ in a study of 233 strains of *Paracolobactrum coliforme* found that 67.2 percent of their organisms were serologically identical or closely related. Thirteen biochemical groups, unrelated to the antigenic mosaics, were established. Little additional information is available on the antigenic components of *P. coliforme*; therefore an attempt was made to group such organisms isolated in the Far East by serologic means.

Twelve strains of *P. coliforme* were available from Stuart's collection. Five cultures were isolated by one of us (W. C. E.) in California, and 135 organisms came from diarrheas in the Far East. Of the latter, 94 originated from United States Security Forces in Japan, six from Japanese Nationals, 23 from United Nations Security Forces in Korea, and 12 from naval personnel visiting Hong Kong. Ninety-one additional strains were obtained from naval personnel without clinical signs or subjective complaints of diarrhea. These organisms were collected during two trips to Hong Kong. Six cultures were obtained from fomites aboard an attack transport during the second of these trips.

All of these organisms were slow lactose fermenters and were variable in their fermentation of sucrose and/or salicin. All formed acid and gas rapidly from dextrose and mannitol, were positive for indole, negative for Voges Proskauer reaction, and

with the exception of Stuart's strains 16311 and 16611 did utilize citrate as the sole source of carbon. Hydrogen was not produced in Hligler's medium.

Serologic groups were determined according to the O antigenic structure following the procedure recommended by Farrmann.² H antigens and serologic relationships to other serogroups of enterobacteriaceae require further investigations, are not being reported here. Table 1 shows the O structure of the examined organisms. With the aid of 14 sera prepared from representative types 74 antigenic groups were determined, 17 organisms (6.4 percent) had antigens which did not fall into any of these groups. Only 24 strains (12 percent) did not either singularly or in combinations the antigens 1 2 3 4 5 9 or 12.

With the exception of serogroup 1 2 and 3 4 5 no serogroup comprised more than 5 percent of the total number of strains examined. No correlation could be established between the biochemical behavior (fermentation of lactose sucrose salicin) and the serologic structure. Due to the small number of organisms in each group it was impossible to postulate the ecology of the strains. Strains of serogroup 1 2 3 4 5 comprising 2.5 percent of the total group, however, were not isolated from diarrheic patients in Japan or Korea, nor were strains of group 1 or 12 isolated from United States naval personnel.

Antigens 6 9 10 and 11 did not appear in Stuart's strains which were isolated in the eastern part of the United States. Several antigens present in these strains which further differentiate members of the groups designated here as 1 2 3 4 5 12 13 were not observed in the types isolated in the Far East. There was a difference between the strains collected from the United States and those in the Far East.

No serologic group was found limited to cases of dysentery limited to an asymptomatic person.

One of the practical implications of this study was however the recognition of the antigenic complexity of *P. coliiforme* strains isolated in the Far East. It is nevertheless possible to use a mixed typing serum in this area prepared against an organism belonging to group 1 2 3 4 5 and against a strain belonging to group 6 9 12. This serum contains antibodies against antigens present in about 90 percent of the organisms studied here and may therefore be considered a valuable diagnostic aid in the Far East.

SUMMARY

Two hundred and fifty *P. coliiforme* strains isolated in the Far East were studied. They belonged to more than 74

TABLE 1 Serologic grouping of *Paracolobactrum coliforme* strains isolated in the Far East

O antigenic structure	Number of strains from					Total strains	Number of strains
	Diarrhoeic patient				Non- diarrhoeic		
	Japan	K	Hong Kong	Others			
1	4			3 () (b)	1	8	1811
12	6	7		4 (b)	10	27	111 441
123	2	1	2	1 (c)	1	7	2 11
1234	3 (d)				2	5	
12345			2		8 ()	10	
1237					1	1	
124	1				1	2	
1246	1 (d)					1	
1247		1				1	
12410	1				1	2	
12578	1					1	
1258,9	1					1	
126	2					2	
1267	1				2	3	
12678	1				2	3	
127	1				2	3	
1278	4				2	6	
127813				1 (b)	2	3	1091
127814					1	1	
1278913	1					1	
1279	1					1	
12714					1	1	
128	1					1	
12813	1					1	
129	5					5	
12913			1			1	
12914					1	1	
1210	1					1	
1211	2				1	3	
1212	1	1			3	5	
1213				2 (b)	1	3	
1214	4				1	5	
134					1	1	
1345			1		3	4	
131114	1					1	
136	1					1	
1314				1 ()		1	

TABLE 1 *Srol g g p g / P racol b ctrum lif rm t ns l t d*
th F E t—C tin d

O g trac ur	Numbe f tra ns from					T l tra	S ua ra umbe
	Dis h p				Non- d ar hea		
	J p	K	H Y g g	O b			
1 4					2()	2	6611
1 5	2					2	
1 6	1	1				2	
1 7 8	1					1	
1 9	1			1()		2	
1 12	5			1(b)		6	
1 13					1	1	
2	1				2	3	
2 3 14			1			1	
2 4 7	2					2	
2 5 10	1					1	
2 6		1				1	
2 6 7		1			1	2	
2 6 12 14			1			1	
2 8	1					1	
2 9	2					2	
2 11 12 14					1	1	
3 4	4				2	6	
3 4 5	8(f)	1	1	1(b)	18(g)	29	311
3 4 6,7	1					1	
3 6	7					7	
3 14					1	1	
4	2					2	
4 6		1				1	
4 10	1				2	3	
5	1				1	2	
6					1	1	
6 7					2	2	
6 9 12		2				2	
7	1(d)					1	
7 8	2				1	3	
7 9					1	1	
8 12	1					1	
10	1					1	

TABLE 1 Serologic grouping of *Proteobacterium coli* from the Far East—Continued

Orogen structure	Number of traits from					diseases	Total
	Diseases						
	J.P.	Korea	Hong Kong	Others			
12	1	3	1		7		
13			1				
14			1				
Unclassified	5(d)	3		3(c)(b)	6		
Total	100	23	12	18	97	25	

() I l t d n Calif nia

(b) Type set in r ed fr m Stuart.¹

() From the Philippines Islands

(d) On the last day in Japan hospital

() On the left format

(f) Tw ur ns ts l t d fr m j p ho p tal

(g) Two surveys in 1964 and 1965.

"O" groups No connection was found between the structure and biochemical behavior No group was found the ill or only in the persons without symptoms differed from the types described by Stuart and polyvalent serum comprising the most frequent recommended as a diagnostic aid

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h. g. n. 1951

PUBLICATION OF THE CURRENT LIST

The Bureau of the Budget has approved continuing publication of the *Current List of Medical Literature*. This continuation includes monetary and page limitations and a restriction on the number of copies that may be printed for official use. It is expected that the Armed Forces Medical Library will be able to operate within these provisions without curtailment of the present scope and coverage of the publication.

CAPT CALKINS APPOINTED FIRST CHIEF OF NAVAL MEDICAL SERVICE CORPS

Captain Willard C. Calkins, a veteran of 35 years in the naval service, became the first Chief of the Medical Service Corps, U. S. Navy. Prior to this appointment on 29 September 1954, Capt. Calkins commanded the U. S. Naval School of Hospital Administration, National Naval Medical Center, Bethesda, Md.



Capt. Willard C. Calkins (MSC) USN (second from right) being sworn in as the first Chief of the Medical Service Corps of the Navy Rear Admiral H. Nunn, Judge Advocate General (left) administering the oath of office to Capt. Calkins and Secretary of the Navy Charles S. Thomas looking on.

The position of Chief of the Medical Service Corps was established by Congress in public law which was signed on 23 August 1954. Previously the Corps was administered by the Assistant Chief for Personnel and Professional Operations, Bureau of Medicine and Surgery.

The Medical Service Corps has grown from about 300 officers at the time of its establishment in 1947 to over 1,000 officers now on active duty.

A MESSAGE FROM THE A M A

With the time for expiration of the Doctor Draft Law (30 June 1955) growing shorter, officials of the Department of Defense and medical manpower experts have been giving consideration to various plans whereby the needs of the armed services for doctors may be met. Dr. Frank B. Berry, Assistant Secretary of Defense (Health and Medical) outlined several such plans in an article in the *Journal of the American Medical Association* in April of this year. It was there indicated that the Department of Defense had sent out copies of a "Senior Medical Dental Student Questionnaire" to obtain from students an indication of their preference with respect to periods of service. Based on the replies to these questionnaires, the three plans, as outlined by Dr. Berry, were (1) a "matching plan" whereby the needs of the service are matched as nearly as possible, with the stated preferences of those liable for service, in terms of service immediately after internship, after two years' training, and after residency training; (2) a plan providing for induction physical examinations during the last six months of the fourth year of medical school and the first six months of internship, and then separating them into "classes" for induction on certain dates, according to the needs of the armed services; and (3) a plan envisioning a uniform two-year period of hospital internship, or training, at the completion of which the great majority of the group would be available for military service and the smaller portion reserved for residency and deferment consideration.

It has now been indicated by the Department of Defense that a decision has been reached with respect to this problem and that plan (1) above will be substantially followed. The Department has set up the Armed Forces Reserve Medical Officers Commissioning and Residency Consideration Program and has issued information concerning it. A "Statement of Preference Form" has been prepared for completion by those liable for military service under the Universal Military Training and Service Act as amended, provided they are graduates of schools of medicine approved by the American Medical Association.

As explained by the Department of Defense, the Selective Service System has agreed to assist the Department of Defense to provide that physician obligated for military service.

From the Council on National Medical Education of the American Medical Association. The undersigned is not a member of the American Medical Association and is not a member of the American Medical Association.

and who are commissioned as reserve medical officers be ordered to duty as needed throughout the year following completion of internship and if more physicians are available than needed to fill requirements that the excess may be considered for deferment for essential residency training as a joint action of the Department of Defense and the Selective Service System. This solution or plan will be known as the Armed Forces Reserve Medical Officer Commissioning and Residency Consideration Program. Those obligated physicians who do not become reserve medical officers will be subject to general induction calls placed by the Department of Defense with the Selective Service System. Physicians who are not reserve medical officers will not be considered for deferment for essential residency training nor may they be given any assurance as to choice of military department for service.

In brief the plan will work as follows: the Statement of Service Preference will be submitted as soon as possible; part 1 of this statement will establish the individual's status as a reserve medical officer or desire to become such; his choice of service or his desire to be deferred for residency training; part 2 of the statement will give information relative to the type and period of residency training desired. According to the expressed desires additional forms will then be forwarded such as Application for Reserve Commission, Request for Deferment for Residency Training, and a Hospital Agreement form.

A schedule of pertinent dates has been set up as follows: 10 October 1954 deadline for the return of Statement of Service Preference; 20 October 1954 all who request them will receive Application for Reserve Commission; 15 November 1954 deadline for the return of Application for Reserve Commission; 15 December 1954 notices will be sent out as to those deferred for training in specialties; 1 February 1955 deadline for the return of forms relating to deferment and hospital agreements.

Once when Pitcairn had occasion to visit a lady ill with consumption he took with him a young friend recently graduated who expressed surprise when Pitcairn prescribed nothing more than a fusion of doses with a little moral aid. Pitcairn turned to the youth. The last thing a physician learns in the course of his experience is to know when to do nothing but quietly to wait and allow Nature and time to have fair play in checking the progress of the disease and gradually restoring the strength and health of the patient.

—LORD MORAN M.D.

The Lancet 1 p 169 J 23 1954

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C t / N Battl l j ur nd D C mp d t B t t l C ualt —
C l B D H l l d MC USA Ch f O pa l l l h B h d
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R b th F ld / A d t l T m —Lt C md R A M l l d
USNR A m d F Fp d m l g cal B d W h gt D C

1 December

A Ep d m l g l St dy / H t l j ur —C p F dg L C k MC USA
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Ge fl y Ed l l M D D Imm l gy D Amy M d l S
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A t R p t y D Et l gy P t d C t l R t T
g S t ns—C md J h R S l (MC) USN H d C mm bl D
B h B f M d d Surge y Depa m t f h N y W h g
D C

Women's Medical Specialist Corps Section Panel

C nt b t / D t t Ph y l Th py nd O p t nal Th py t
th B ld g / H l th D f ns F nt —L M y B Ca (MSC)
USNR U S N val H p l B th d Md Cap F M G
USAF (W MSC) H p l za d Eva ua t D Off f h
Sur G ral D p m f h A F d M j Ag P S yd
W MSC USA Ch f Ph y l Th p W l R d A my H p t l W h
g D C

Dental Section Panel

The Dentist and Dental Laboratory Responsibilities in Rendering Prosthetic Treatment—Col Lynn C Dirksen DC USA Commanding Officer Central Dental Laboratory Walter Reed Army Medical Center Washington D C

Rotating Dental Cutting Instruments—Col Donald C Hudson USAF (DC) and Maj Jack L Hartley USAF (DC) National Bureau of Standards Washington D C

Ultrasonics in Dentistry—Comd Arne G Nielsen (DC) USN U S Naval Dental School Bethesda Md

Medical Service Corps Section Panel

Status of the Medical Service Corps of the Army Present and Future—Col Robert L Black MSC USA Chief Medical Service Corps Office of the Surgeon General Department of the Army Washington D C

Status of the Medical Service Corps of the Navy Present and Future—Capt Willard C Calkins (MSC) USN Chief Medical Service Corps Bureau of Medicine and Surgery Department of the Navy Washington D C

Status of the Medical Service Corps of the Air Force Present and Future—Col Phillip G Fleetwood USAF (MSC) Chief Medical Service Corps Office of the Surgeon General Department of the Air Force Washington D C

The Role of Optometry and Medical Allied Sciences in the Preventive Medicine Program of the Armed Forces—Lt Col Ralph W Bunn MSC USA Chief Entomology Section Preventive Medicine Division Office of the Surgeon General Department of the Army Washington D C Lt Col Samuel P Daykin USAF (MSC) U S Air Force Hospital Sampson Air Force Base NY Comdr William J Perry (MSC) USN Head Medical Allied Sciences Section and Comd John H Strive (MSC) USN Head Optometry Section Bureau of Medicine and Surgery Department of the Navy Washington D C

Pharmacy Section Panel

Pharmaceutical Aspects Involved in Accreditation of Hospitals—Moderator Lt Col Henry D Roth MSC USA Chief Pharmacy Supply and Administrative Section Medical Supply Division Office of the Surgeon General Department of the Army Washington D C

Nursing Section Panel

Categorization of Patients According to Nursing Care Needs in U S Army Hospital Fort Belvoir—Maj Esthe Claussen ANC USA U S Army Hospital Fort Belvoir V

The Nurse in Air Medical Evacuation—Lt Col Frances I Lay USAF (AFNC) Chief Nurse Gunter Franch School of Aviation Medicine Gunter Air Force Base AL

Resident on Neurosurgical Service—Lt J F Thomas (VC) USN Educator on Office of Navy Nurse Corps Purposes of Medicine and Surgery Department of the Navy Washington D C

Sanitary Engineering Section Panel

E g neer g A p t f the N H lth H d—L C l J k C Ca
ma ha l USAF (MSC) H dqua Air Mat l C mma d W ght P t
A F B Oh

S t y E g ne g the N y—Mr Bur L hart Bur f Y d d
Docks Depa tme f th N y W h gt D C

F ld Study f the U f 3 l C nt t d M lk t A my P t—Lt C l
R b t G M Call MSC USAR Ch f E ur ame t l Sa t D
Army Ch mi l Ce t Md

Veterinary Section Panel

T g / A med F V t nary Off n H lth Phy cs—Lt C l
B na d F Tum VC USA Med l R r h Lab rat ry Ag ltur
R h P gram U ty f T Oak R dge T

REGULAR MEDICAL CORPS OFFICERS CERTIFIED BY SPECIALTY BOARDS

The American Board of Physical Medicine and Rehabilitation

Activated in 1947 the American Board of Physical Medicine and Rehabilitation is one of the youngest specialty groups. As of 30 June 1953 this board had certified a total of 939 physicians of whom the following 11 are regular Medical Corps officers:

J me D Am May USA
J hn H Ku Lt Col USA
H rold B Lus mbe Col USA
W l H M or J May USA
W y R Oelhaf May USA
Ra ul C P k J Lt Col USA

Emm M. Smi b Col USA
B A. S kl nd J Col USAF
V S T yl M J USA
A thur E White Col USA
Cl k B Williams Col USA

This he f ur th f The nam f ff nt f d by th Am
Bo d f P Md will be publ h d h Dec mber ue

Pain cannot be ruled out by physical or laboratory examination. The pain threshold is very much the same in all persons. Their reaction to it differs widely. A person's reactions vary with his previous experience with pain, his mental balance, his life situations, his misapprehensions, and worry concerning the significance of pain and a desire or lack of desire to keep on with his work. It requires profound experience in the practice of medicine to evaluate the significance of pain.

—EARL D M BRIDE M D

CI I M d p 598 Nov 1953

Reviews of Recent Books

ATLAS OF OPERATIVE TECHNIC ANUS RECTUM AND COLON by
Harry E Bacon M D and Stuart T Ross M D 301 pages 403 illus
 trations The C V Mosby Co St Louis Mo 1954 Price \$13 50

The authors of this excellent volume have produced a comprehensive descriptive atlas of surgical procedures dealing with diseases of the anus rectum and colon There has always been some interest shown in this field In recent years however it has gradually increased so that it has now assumed its proper importance in the realm of preventive medicine and surgery

Major surgical procedures with radical resection of all possible lanes of malignant extension are portrayed in detail Minor surgery occupies a considerable space and is given proper recognition in the same manner The anatomy of the areas involved and anatomical relations with adjacent organs followed by descriptive illustrations are arranged in proper sequence The text is complete in every way and provides the means by which the busy proctologist or general surgeon may have at hand a reference for rapid review of intended procedures

This book is the first of its kind and includes every recent advance It should prove a valuable addition to all medical libraries

—GEORGE M. LYNCH *Comdr (MC) USN*

AN RH HR SYLLABUS by *Alexander S Wiener M D* 82 pages illustrated
 Grune & Stratton Inc New York N Y 1954 Price \$3 75

In glossary discussion form this compact syllabus covers briefly and adequately on a clinical level every phase of the subject under the sections fundamentals Rh antibodies serology and genetics of the Rh Hr types erythroblastoses fetalis blood transfusion auto-sensitization anthropologic aspects and medicolegal applications All this has been accomplished in 82 pages including an index

This form of presentation of so complex a subject has many advantages It serves as a convenient introductory text for readers not specializing in the field and offers them a means for appreciation of current articles on the subject Physicians particularly interested in the Rh factor and specialists in the field will find this book a handy reference and a worth-while refresher Those responsible for the instruction of blood bank personnel will recognize in this timely booklet the original classic Rh glossary introduced by Dr Wiener It is an excellent teaching aid and will be of invaluable assistance to the blood bank student —GIOCONDA R SARANIERO *Lt Comdr (MC) USN*

NATURE AND NURTURE A MODERN SYNTHESIS by J b L F H 40
pag s D bl d y & C I Ga d n C ty N Y 1954 P c \$0 85

Dr Fuller a biologist presents in this paper a summary of past and present principles of genetics oriented to psychological findings in intelligence behavior disturbances and the development of individuality. Considering major genes and polygenes he writes that polygenic or multiple factor inheritance is the type which is of greatest significance to our nature nurture problem. The inheritance of susceptibility genes and the concept of thresholds are discussed in relation to normal and abnormal behavior. The author acknowledges that the biological attributes which are of universal value are physical vigor the ability to modify behavior according to experience and the ability to extract meaning from more and more complex situations. A brief bibliography and glossary are included.

While the reader may be no more satisfied with the anonymity of the undefinable polygenetic theory of complex behavior than with the theories of complete social determination this reviewer believes that this paper can serve as a caution to psychological theorizing which neglects genetic inheritance. The article while not crucial in itself is well worth reading.—JOHN T EVANS Ph D

TEXTBOOK OF BIOCHEMISTRY by B j m Harrow Ph D d Ab b m
Ph D 6 h d 563 pag ll trat d W B Sa d C
Ph l d lph P 1954 P \$6 50

The new addition of Harrow's well known text which now bears the name of a coauthor has been revised and the subject matter is regrouped and extended. It preserves the classical format of chapters on the chemistry and metabolism of carbohydrates lipid proteins and inorganic constituents along with others on digestion respiration blood urine foods enzymes hormones and energy metabolism. Additional chapters are devoted to tissue chemistry and detoxication and there is a single chapter dealing with sulfadiazine and antibiotics. Economy and clarity of language permit the inclusion of blood plasma protein fractionation electrophoresis chromatography the ultracentrifuge and the use of isotopes.

The relatively brief chapter on energy metabolism benefits greatly from the judicious use of sample problems. The treatment of enzymes includes technique for the recognition of enzyme activity as well as presentation of the theoretical aspects of enzyme action. The role of high and of low energy bonds is logically developed in connection with carbohydrate metabolism. Vitamins are presented in sufficient detail to reflect present day knowledge concerning their composition and their complex role within the intact organism. The chapter on hormones includes a straightforward discussion of the better known facts concerning the sections of the thyroid parathyroid pituitary pancreas adrenal testes and ovary. The presentation is detailed

without becoming ponderous. In their handling of the references found at the close of each chapter the authors achieve a potent incentive to further reading. This follows from a careful grouping of selected literature bearing upon the separate chapter topics along with notations concerning the specific subject matter province of the references cited. The volume is further enhanced by the uniform clarity of the figures and tables.

In addition to its value as a text this book might be expected to serve a highly useful purpose in the clinical laboratory. It is a convenient source of information concerning the basis of many if not most of the clinical chemistry determinations generally performed. An index to the composition of blood and urine in the normal and in pathologic states.—**THADDEUS J. DOMANSKI** Lt Col USAF (MSC)

GIFFORD'S TEXTBOOK OF OPHTHALMOLOGY, by Francis Heed Adler
M D 5th edition 488 pages illustrated W B Saunders Co Phila
delphia Pa publishers 1953

This excellent book discusses all the aspects of ophthalmology which the general practitioner should know and provides a satisfactory outline for teaching ophthalmology in medical schools. It is intended to be an introduction to ophthalmology and should be invaluable to all physicians.

The chapters on examination of the eyes are well presented. The descriptions of functional examinations are detailed enough for the physician to evaluate his patients. The chapters on ocular mobility and the lesions disturbing the pathways preventing normal responses to stimuli are exceptionally well written and sufficient facts about optical defects are given for clear understanding. External diseases of the adnexa lids conjunctivae the various ocular tissues and the orbit are adequately presented. The physiology and pharmacology pertinent to the conditions under discussion are briefly presented but the essential factors are given. A clinical approach has been given to the ocular findings in neurologic diseases. The information on vascular diseases is splendidly presented and should be invaluable in physical diagnosis.—**WILLIAM L. SPAULDING** Col MC USA

DIAGNOSIS OF ACUTE ABDOMINAL PAIN by William Requaarb M D
For word by Warren H Cole M D 243 pages illustrated The Year
Book Publishers Inc Chicago Ill 1953 Price \$5

This handbook presents important diagnostic procedures in acute surgical lesions within the abdomen. The indications for surgical intervention are also included.

The presentation is in three parts (1) a discussion of the various maneuvers and tests which may be utilized in examination of the abdomen and in arriving at a correct diagnosis (2) a description of intestinal obstruction and differentiation between obstruction of the small and

large testicles and (3) a section concerning a large group of cutaneous diseases of the abdomen including diagnosis of acute abdominal pain following trauma abdominal pain in infants and the differential diagnosis of massive gastroesophageal hemorrhage.

Some of the opinions expressed by the author on such a controversial subject as management of cholecystitis may be questioned. In general the text is concise, reads smoothly and is easily understandable. The illustrations are well chosen and clinically manifestations are presented in detail. In addition, pertinent references are included in each chapter.

This small handbook will serve as an excellent reference for the young surgeon—especially on the resident staff—and also for anyone doing emergency work involving the abdomen.

—JAMES D KING C mdr (MC) USN

VETERINARY NECROPSY PROCEDURES d t d by Th ma C lyl J ne
Lt C l VC USA d Ch st A Gl is Lt C l VC USA Spo
d by Th Arm d F I t tut f P th l gy d Th Arm
V na y M dic l A on 136 pag s llus rat d J B L pp
C Ph l d lph P 1954 P \$7.50

This book is the latest compilation of information on animal necropsy procedures and covers all species of animals. Each chapter has been written by an eminent pathologist selected because of his particular qualifications in regard to the assigned topic. The book fills a very definite and long recognized need—a need especially apparent at the Registry of Veterinary Pathology where excellent specimens were frequently received in an unsuitable condition.

After the importance of necropsy is stressed a clear presentation of the general principles of necropsy is given including the appropriate time place equipment records method of euthanasia, and methods of disposal. Succeding chapters are devoted to detailed procedural instructions pertaining to horses cattle sheep swine dogs cats chickens and other birds and laboratory and wild animals. Instructions are clearly and concisely presented along with numerous excellent illustrations.

Further chapters are devoted to instructions on preparing necropsy protocols, selecting and preparing specimens for laboratory examination and collecting and preserving parasitologic specimens. The final chapter gives suggestions on methods of collecting and submitting samples in a manner that will facilitate laboratory diagnosis. Some 30 diseases commonly requiring laboratory support for diagnosis are discussed.

The simple illustrations are understandable and accomplish their purpose well. All text material is presented in a readable and interesting manner. This book will be a popular guide for veterinarians and others who may be called upon to perform animal necropsies.

—WAYNE O. LESTER Br g G n USAF (VC)

NURSE AND PATIENT by *Evelyn C Pearce* S R N 182 pages J B Lippincott Co Philadelphia Pa 1954

This book presents a significant and valid approach to the ethics of nursing and the transitions involved in it as based on the sound principles of human relations. Its value rests primarily on the clarity with which the reader's concepts are formulated and the ease with which these concepts can be used constructively.

The subject matter is divided into three parts. The first part presents the factors that lead to a physical or mental breakdown in health and the reactions of patients to such a state. Whenever a person is confronted with circumstances which alter his normal way of living and afflict him with pain and disability his behavior will vary from its normal pattern. Though his behavior varies it will remain within a reasonably predictable compass. The nurse should recognize this and through an understanding of nurse-patient relationships be able to give the needed support to the patient during the acute stages of his illness and his convalescence. The second part deals with the nurse as a person in a profession that is primarily concerned with persons under the abnormal circumstance of illness. It emphasizes the personal and professional adjustment problems confronting the teen-age student nurse as she meets the stress and strain of a patient's emotional problems. The last part stresses human rights and their safeguards in society. Consideration is given to the nurse's understanding of the fundamental principles of human relations as related to the preservation of body, character and soul of man. In conclusion the author advances a Christian interpretation of spiritual first aid.

This book is especially recommended for student nurses and instructors of young nurses. It should aid the student nurse in acquiring a more meaningful concept of self as related to the ill, as well as a better understanding of the patient's reaction to his illness. To the instructor it should serve as a reminder of the physical and emotional stress and strain placed on the teen-age student nurse in meeting the problems of the ill for the first time.

—QUIDA C. UPCHURCH, Lt (N) USN

CLINICAL ORTHOPAEDICS *Anthony F DePalma* Editor-in-Chief Number 3 230 pages illustrated J B Lippincott Co Philadelphia Pa 1954 Price \$7.50

This publication is an orthopedic journal in book form that admirably accomplishes the stated purpose of providing a needed outlet for original articles of orthopedic interest. Divided into two sections, the first section deals with conditions of soft tissues about the joints while the second presents miscellaneous orthopedic subjects.

The first 127 pages are devoted to the section on soft tissues about the joints which is written by 16 well-known orthopedic surgeons.

The subject is clearly presented and well illustrated by photographs and diagrams. Individual articles are brief, concise and easy to read. Differences of opinion as to therapy advocated by the various authors is interesting as well as stimulating. R. A. Murray's statement that cysts of the external meniscus are more common in females is probably an inadvertent error.

The section on general orthopedic subjects varies from giant cell tumors to intramedullary pinning of Colles' fracture. This section is also well illustrated and the authors have made liberal use of simple diagrams which add materially in clarifying important points.

This bound journal is recommended as excellent reading for the orthopedic surgeon and is considered together with volumes one and two to be a valuable addition to any medical library.

—CLIFFORD A. STEVENSON, *Comdr (MC) USN*

THE LABORATORY DIAGNOSIS OF LEPTOSPIROSIS by J. W. W. M. D.
 Am. J. L. ur. S. i. Publica. Numbe 183. A. M. g. ph. in
 Am. J. L. ur. T. t. d. T. h. q. Ed. d. by G. l. b. t. D. l. d. o. f.
 M. D. 99 pag. Ill. tra. d. Cha. l. C. Th. ma. Publ. h. Sp. g. f. ld.
 Ill. 1954 P. \$3.75

This monograph by a world recognized authority on the leptospiroses is intended as a practical guide in leptospiral diagnostic laboratory procedure. The techniques described were developed in laboratories in the Netherlands and in the East Indies and are presented clearly and in detail.

In addition to sections on general considerations, leptospiral morphology, staining methods and diagnostic procedures, sections entitled Antigenic Structures of Leptospira and Characteristics of Type Strain of Leptospira are included. These latter while not directly bearing on laboratory diagnostic procedure are a most valuable supplement to the other sections. The information on the origin of the several type strains and their serologic interrelationships is of especial interest to the leptospiral research work.

The value of this volume for the American laboratory diagnostician might be enhanced in future editions by photomicrographs illustrating agglutination and lysis reactions and the so-called breeding test. Likewise a fuller discussion of serologic methods other than agglutination-lysis would be helpful. Complement fixation method in particular would appear to warrant greater consideration.

This volume is attractively printed and bound and is of a convenient size to keep as a ready reference in the laboratory. It should serve as an authoritative guide in the diagnostic laboratory and will be particularly helpful to those who are relatively inexperienced in the laboratory diagnosis of leptospirosis.

—WILLIAM S. GOCHENOUR, *J. L. C. I. VC USA*

MANUAL OF PROCTOLOGY by Emil Garret M.D. 346 pages illustrated
The Year Book Publishers Inc Chicago Ill 1954 Price \$7.50

The author of this manual in the familiar yearbook format states that it is intended not for the specialist but for the practitioner. The reviewer would recommend it also for the intern and resident in general surgery.

Following a short section on anatomy anesthesia is discussed concisely and the author stresses local or nerve blocking techniques favoring procaine solution as a short acting anesthetic and oil soluble anesthetics for prolonged action. Several of the popular traditional medicaments (suppositories and mineral oil for example) are the subject of an expose. A section on pediatric proctology and congenital anomalies admittedly inadequate is presented but those interested are referred to an adequate bibliography.

Anorectal pyogenic infections are concisely but thoroughly presented. The chapter on hemorrhoids is well written but unfortunately includes five pages on the technique for sclerosing injection treatment. Neoplasms benign and malignant are discussed in detail with appropriate statistics and methods of treatment. The subject of ulcerative colitis is presented at length and the more recent indications for surgical management are given.

The treatment of rectal prolapse is presented in a general fashion and one might object that the more recent approach to surgical treatment of diverticulitis of the sigmoid colon is not discussed. A chapter on pilonidal disease brings the reader up to date on the various methods of treatment. The author favors primary closure but admits its shortcomings and gives indications when it is best used.

As a manual this is an excellent text and serves well as a beginning to the interns residents in general surgery and general practitioner. The comprehensive bibliography following each chapter is a guide for the more complicated and detailed procedures. Illustrations are in black and white and are adequate and clear. It is concise well written and easily read.—PHILIP A COX Maj USAF (MC)

GLANDULAR PHYSIOLOGY AND THERAPY Prepared Under the Auspices of the Council on Pharmacy and Chemistry of the American Medical Association 5th edition completely revised and rewritten 611 pages illustrated J B Lippincott Co Philadelphia Pa 1954 Price \$10

The first edition of this collection of opinions was published in 1924 when the physiologic functions of the endocrine glands were rather well defined but knowledge of endocrine therapy was very limited. The rapid evolution of therapy in this field during the past 30 years especially with the developments since the last previous edition of the book in 1942 makes it quite possible that this symposium may not be presented in a sixth edition. Not only have highly potent hor-

l gents been developed and made avail ble but also excellent text books on endoc nology ha e been published

After an introduct n to e doocrinology th subject matter is presented be utifully in chapters n th adenohypophysis the posterior lobe of the hypophysis the adren l (cortex and medull) the ovary (with further consider tion of m nstruation ovulat on pregna cy and lactatio) the testes the thyro d the pa athyroid glands the pancreas and the thymus Separate discussion re dded on abnormal ities of body weight ndocrine man gement of neoplastic diseases abnormal ties of sexual behav r therapeutic use of corti one and corticotropin in n n d cri e co ditio beh vior nd intelligence the chemistry of hormones and modes of administr tion of hormones

The individual contributo s to th s volume have p rformed their tasks in an dmur ble ma ner E ch chapter is ery well nnotated with a total of ne ly 4 000 ef rences cited These dd tremendously to the value of the ymposium Of special interest to the read ot prof u dly r predom n ntly interested n the f eld of endocrinology will b the ch pter on di gno tic ids nd the one on common m s c n eptions n endocrine the apy—RALPH L COX C I MC USA

PERIPHERAL CIRCULATION IN MAN d d by G E W W l t b l m
M B d J S F ma M B D P H 219 pag w th 72 ll
rat L ttl B ow d C B t M 1954 P \$6

This report of a Ciba Fou dati n ymposium followed an e rlier one on Visceral Circulation Most of the 32 participants n th s ymposium we f om the British Isles and from Europ an cou tris with om rep sentati es f om the United States The first part f the symposium is de oted to method of measurem nt nd study of the circulation in man foll wed by a sect on o n adrenal nd dren line nd lat o the eff cts f xpo ure to c ld Other chapters concern the regulation of the blood flow i cl ding the neuro histology f the circulation nd final sectio s ar d oted to sympa thectomy

The reports of e ch investigator n th r sult of his own work followed by the di cu sion of the various memb s present is prob ably the be t part of the book A might be expected very few final c clus ns were reached but the subj cts pes nt d are well covered Excellent reference are includ d at the end of e ch chapter

This book w ll have limited app al b cause the det il presented are not tho e encount red by the physician n everyday pr ct ce It would b of interest however to all those eng ged in basic re earch and cl n cal rese rch who are studying the periphe al circulation in man This symposium was successful in the u al objective of thi type of m eti g of hav ng people fr m various centers discuss their work nd outline th ir areas of gre m t d agrement and field i wh ch there s gnor nce—SAMUEL H SANDIFER LI C I MC USA

CLINICAL PATHOLOGIC CONFERENCES OF COOK COUNTY HOSPITAL
 Volume I Cardiovascular-Renal Problems Edited by Hans Popper
 M D Ph D and Daniel S Kushner M D 325 pages illustrated
 The Blakiston Company Inc New York N Y 1954 Price \$5

This book composed of reports of clinical pathologic conferences held at Cook County Hospital from 1946 to 1953 presents chosen examples of cardiovascular renal disease representative of the majority of patients encountered in that hospital. There are 26 diagnostic problems in all. Case histories observe the usual pattern of following the presentation of clinical data with a clinical discussion. Pertinent pathologic observations and a clinical pathologic correlation are then made. The case is completed by a concise Final Pathologic Diagnosis. A few well chosen references are listed and clear photographs illustrate specific lesions.

In the impressive list of 42 participants many are nationally recognized authorities in their fields. General medicine is well represented as would be expected but many other specialties are included.

The case histories are fascinating to read and especially interesting to compare with similar examples from one's own experience. Each yields much information on such points as diagnosis, therapy, management and complications. The clinical pathologic correlations are clear and unusually thorough. There are controversial points of interpretation which of course must be expected.

This volume is recommended for both the internist and the pathologist. The latter may use it as a guide in choosing similar case histories from his own experience for clinical pathologic conference material.—PAUL C. LE GOLVAN, L.I.C.I. MC USA

APPLIED PATHOLOGY As An Introduction to Disease and Its Control by Charles G. Darlington M D and Charlott F. Davnport R N. With the Collaboration of Albert Segnitz M D. 2d edition revised. 454 pages 154 figures 4 color plates and 29 charts. J. B. Lippincott Co. Philadelphia Pa. 1954. Price \$4.75.

This book is a revision of the 1942 edition which bore the title *Introduction to Medical Science on a Basis of Pathology*. The authors have integrated the basic studies in nursing—anatomy, physiology, chemistry and microbiology—in a concise and practical manner which makes the material easy to understand and practical to apply in the nurse's everyday work.

The first part, disease and its control, is an introduction to medical science. It deals with the history of medical science, the causes and manifestations of disease and the therapies and prevention of disease. Particularly important is the presentation of the new theories on cancer and the nurse's responsibility in cancer control. The second part on the pathology of disease according to the systems of the body is divided into 12 units, each dealing with a specific system and its

senting diseases and treatment of each. Part three deals with the clinical tests and procedures, microbiology, tissue examinations, autopsies, and records, and is particularly interesting and well organized. Various tests are explained giving the normal and the abnormal reactions. The discussion of the proper method of collecting and handling specimens for the laboratory is most informative and useful.

At the beginning of each chapter in part two the unusual medical words used and their correct pronunciation are listed. This is helpful and should aid in increasing the reader's medical vocabulary.

The review exercise at the end of each chapter are excellent. These are the many excellent illustrations. The 14 page bibliography lists all references by chapter.

In all this is an excellent book for both the student and the graduate nurse.—*MILDRED TERRILL, Comdr (NC) USN*

ISOTOPIC TRACERS by G. E. F. W. M. H. G. d. A. W. mail 306
 pag. 11. ma. d. P. bl. h. d. by U. ty. f. L. d. Th. A. hl.
 P. t. th. S. t. H. u. L. d. W. C. l. D. t. b. d. by J. h. d.
 Graff. I. N. w. Y. k. N. Y. 1954. P. \$7.

Written especially for student and research workers, this theoretical and practical manual concerns the use of radioisotopes as tracers. It will appeal to investigator who desire a concise explanation of the practical aspects of isotope methodology particularly in relation to biological research. The authors have included up-to-date and reliable data on the physical characteristics of radioisotopes and radiations, the types of apparatus and equipment available and the experimental techniques used by their workers in the field.

The book is arranged so that it can be used as a manual for laboratory instruction. Most of the experiments described in the practical section of the book can be conducted satisfactorily in any biochemical laboratory possessing the appropriate Giger-Muller counters, scalars, and high tension units. Some of the exercises include experiments which were done in research investigations in the author's laboratory, others were specially arranged, and others were based on publications in various textbooks and journals. The first part of the book contains an excellent discussion of atomic structure, the preparation, synthesis, properties, and measurement of radioisotopes. The chapter on hazard and precaution in the use of radioisotopes should be read by every investigator in this field. Another valuable feature of the book is the appendices which contain considerable useful information and data.

This book is well written and compact. It is recommended as an introductory book for biochemists, physiologists, and others who have a special interest in, but limited presence of, research with radioisotopes and stable isotopes.—*MAXWELL DAUFREUILLE, MC USA*

GENERAL CYTOLOGY by E D P De Robertis M D W W Nowinski
Ph D and Francisco A Saez Ph D 2d edition 456 pages illus
trated W B Saunders Co Philadelphia Pa 1954 Price \$7.75

Cytology is of such fundamental significance to medicine and all the biological sciences that the substantial advances made in recent years should be known and understood by students and practitioners as well as by actual investigators in the field. This carefully revised edition of a concise but authoritative text and reference book is therefore particularly opportune. Its usefulness is suggested by the fact that it is to be printed in at least four foreign languages.

The present volume appearing six years after the first edition embodies extensive changes in all but one of the 12 chapters that on history. Important additions include new sections on plastids, cell metabolism and the effects of radiations and chemical agents in cytogenetics. The cytochemical organization of the cell is adequately discussed and new findings in regard to cytochemistry and ultrastructure are presented.

This is a comprehensive textbook and as such deals only rather briefly with each of the important aspects of modern cytology. It makes possible a rapid survey of the entire field and for those who wish to go more deeply into a particular phase extensive bibliographies current through 1953 are provided at the end of each chapter.

No one concerned with medicine, dentistry or any of the biological sciences with the possible exception of advanced students in the field of cytology itself could fail to find this book both interesting and instructive.—BENNETT F. AVERY Capt. (MC) USN

TEXTBOOK OF THE NERVOUS SYSTEM by H. Chandler Elliott Ph D 2d edition 437 pages 158 illustrations and an atlas of 50 plates J B Lippincott Co Philadelphia Pa 1954 Price \$9

This textbook for medical students presents the difficult subject of neuroanatomy in a manner the author believes will assist the reader in remembering and understanding. The thought that this is a text for students and not a reference work for specialists is a constant theme.

In the first part of the book from chapter I through 7 the subject of neuroanatomy is presented briefly and simply. The author terms this section "The Nervous System in Outline." In the second portion of the book termed "The Nervous System in Detail" from chapter 8 through 24 the outline is filled in and the material is discussed a second time. These two sections comprising most of the text are followed by an adequate bibliography and an atlas of 50 photographic plates 47 of which are accompanied by a well labeled key. This latter feature is said to have been popular with students.

The book represents another excellent example of the author's style. It appears to be a good one. The author's style is clear and concise.

text readable and the diagrams as well as the atlas helpful. A few figures in the text unfortunately are not completely clear and one clinical reference concerns a possible treatment method in neurologic practice which has largely been abandoned. These are not serious drawbacks and the medical student should find this text useful.

—JOHN W. KEMBLE, C I MC USA

CHEMOTHERAPY OF INFECTIONS by H. O. J. C. H. Ph. D. 248 pages
Illustrated by J. H. W. I. & S. I. New York, N. Y. 1954 P \$4

This volume gives complete and up-to-date information on the development of chemotherapy and the application of drugs in such specific infections as tropical diseases, tuberculosis, and syphilis. The fundamental concept of the host-parasite-drug relationship is presented in a simple and concise manner. The chapters on "The Problem of Getting the Chemical to the Microbe," "The Development of Resistance to Drugs by Microbes," and "How Antimicrobial Substances May Work" are timely and written in a simple fashion. In the final chapter the author indicates both the limitations and future possibilities in this field.

The author states that the present book is planned so that the level rises as the reader proceeds. This plan has been carried out skillfully in preparing a book which may easily be read by persons having a minimum of medical education. The book is well illustrated and each chapter has an adequate reference list and should serve as an excellent introduction to the field of chemotherapy. It will also be an enjoyable review and refresher source for those more advanced in the subject.—ROY L. MUNDY, C PI MSC USA

THE BACTERIAL FACTOR IN TRAUMATIC SHOCK by J. B. F. M. D.
82 pages, Chapter 1, C. Th. ma. P. bl. h. Sp. g. f. ld. Ill. 1954 P
\$2.75

This monograph offers a theory to explain why shock can persist and become irreversible despite adequate fluid replacement. The thesis is based largely on the results of animal experimentation, namely that bacterial action may be the dominant factor responsible for the irreversible state in various forms of traumatic shock. The author offers experimental proof to refute some of the more popular concepts that have been advanced to explain this condition. He has demonstrated that in the dog irreversible shock can be prevented if the tissues in particular the liver are protected by antibiotics. Prophylactic administration of an adequate dose of antibiotics was more effective than the administration of an equal dose after shock had developed. While this theory may not supply the all-conclusive solution it does contribute a valuable step toward the understanding, prophylaxis, and treatment of this most complex and frustrating problem.

—FERDINAND V. BERLEY, Comdr (MC) USN

THE JEALOUS CHILD by Edward Podolsky M D 147 pages Philosophical Library New York N Y 1954 Price \$3 75

This psychiatrically oriented book seems to be intended primarily for the instruction of parents who are unfortunate enough to have children suffering from any of the following conditions rheumatic heart disease tuberculosis diabetes obesity, glandular defects nervous disorder and speech defects Incongruously included in this group is the left handed child The author believes that all such children are bound to develop emotional disturbances unless corrective measures are instituted He also examines the sad plight of the unwanted child the adopted child the illegitimate child the child of divorced parents the only child and et cetera with special attention to the impact of their peculiar and particular life circumstances on their emotional development

Although the chapter headings are promising the contents do not do justice to the complexity of the respective problems, probably because the author is not addressing himself to a professional audience The problem of jealousy which is ubiquitous in children is only dealt with in a cursory fashion and no sharp distinction is made between normal competitive jealousy and its pathologic variants The advice to parents is at times too stereotyped and nonspecific The book also suffers from the absence of illustrative case material

The text is filled with many psychiatric truisms which are not presented in sufficient detail and structure to allow either quasiprofessional or lay readers to intelligently follow any flexible plan and thereby like so many other books which have been written over the past few years, would seem only to confuse the reader more than to enlighten

—RICHARD R CAMERON Lt Col MC USA

RESUSCITATION OF THE NEWBORN by Joseph D Russ M D 55 pages illustrated Charles C Thomas Publisher Springfield Ill 1953 Price \$2 50

In this short concise and clearly written monograph the author has summarized the essential points of neonatal asphyxia and its treatment in chapters on definitions and classifications the clinical factors contributing to asphyxia the methods of resuscitation the after-effects of asphyxia and the importance of education of physicians concerned with this problem Both clinical and pathologic considerations are given in connection with the so-called asphyxial membrane

The chapter on the clinical factors producing asphyxia in the newborn including a tabulation of the effects of the various anesthetic agents used in obstetrics on the mother and the infant is especially enlightening A simple routine of resuscitation is presented embodying the four principles of immediate warmth minimum handling a clear open airway and oxygenation of the blood stream within 30 seconds of severing the cord

text readable and the diagrams as well as the atlas helpful. A few figures in the text unfortunately are not completely clear and one clinical reference concerns a possible treatment method in neurologic practice which has largely been abandoned. These are not serious drawbacks and the medical student should find this text useful.

—JOHN W. KEMBLE *C I MC USA*

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Illustrated by J. H. Wiley & S. I. N. W. Y. N. Y. 1954 P. \$4

This volume gives complete and up-to-date information on the development of chemotherapy and the application of drugs in such specific infections as tropical disease, tuberculosis, and syphilis. The fundamental concept of the host-parasite-drug relationship is presented in simple, direct, and clear language. The chapters on The Problem of Getting the Chemical to the Microbe, The Development of Resistance to Drugs by Microbe, and How Antimicrobial Substances May Work are timely and written in a simple fashion. In the final chapter the author indicates both the limitations and future possibilities in this field.

The author states that the present book is planned so that the level is suitable for the reader's needs. This plan has been carried out skillfully in preparing a book which may easily be read by persons having a minimum of medical education. The book is well illustrated and each chapter has an adequate reference list and should serve as an excellent introduction to the field of chemotherapy. It will also be an enjoyable review and refresher source for those more advanced in the subject.—ROY L. MUNDY *C pt MSC USA*

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—FERDINAND V. BERLEY *Comdr (MC) USN*

New Books Received

Books received by the U. S. Armed Forces Medical Journal are acknowledged in this department. Those of greatest interest will be selected for review in a later issue.

- DISEASES OF THE SKIN** by *Ole Frøen* M. D. Rush Professor of Dermatology Emeritus University of Illinois Attending Dermatologist to the Presbyterian Hospital of Chicago Member of the American Dermatological Association and the American Academy of Dermatology and Syphilology Corresponding Member of the Section of Dermatology of the Royal Society of Medicine London of the Societe Francaise de Dermatologie et de Syphilographie Paris of the Dansk Dermatologisk Selskab Copenhagen Societas Dermatologica Svecica Stockholm Honorary Member of the Wiener Dermatologische Gesellschaft Vienna of the Japanese Dermatological Society Tokyo of the Greek Union of Dermatology and Venereology of the Hellenic Antivenereal Society Athens of the Nederlandsche Vereniging van Dermatologen Amsterdam of the Asociacion Argentina de Dermatologia y Sifilologia Buenos Aires and Die Deutsche Dermatologische Gesellschaft Wurzburg and Hamiliton M. D. M. S. Professor of Dermatology and Syphilology Mayo Foundation for Medical Education and Research Graduate School University of Minnesota Rochester Minn. Consultant in Section of Dermatology and Syphilology Mayo Clinic Member of American Dermatological Association American Academy of Dermatology and Syphilology Society for Investigative Dermatology Corresponding Member of the Societas Dermatologica Hungarica Budapest of the Asociacion Argentina de Dermatologia y Sifilologia Buenos Aires of the Societe Francaise de Dermatologie et de Syphilographie Paris Societas Dermatologica Svecica Stockholm La Societe Dermatologique Copenhagen and Honorary Member of the Sociedade Brasileira de Dermatologia e Sifilografia Rio de Janeiro 8th edition thoroughly revised 1503 pages 666 figures containing 750 illustrations and 18 colored illustrations on 11 plates Lea & Febiger Philadelphia Pa. 1954 Price \$22
- PRACTICE OF ALLERGY** by *Warren T. Vaughan* M. D. Richmond Va. Revised by *J. Harvey Black*, M. D. Dallas Tex. 3d edition 1164 pages illustrated The C. V. Mosby Co. St. Louis Mo. 1954 Price \$21
- CEREBROVASCULAR DISEASE** by *James Peter Murphy* M. D. Assistant Clinical Professor of Neurological Surgery George Washington University School of Medicine Foreword by *Peckham Bailey* M. D. 408 pages illustrated The Year Book Publishers Inc. Chicago Ill. 1954 Price \$12
- PSYCHOMOTOR ASPECTS OF MENTAL DISEASE** An Experimental Study by *H. E. King* Ph. D. Associate Professor of Psychiatry (Research Psychology) Tulane University School of Medicine 185 pages illustrated. Published for The Commonwealth Fund Harvard University Press Cambridge Mass. 1954 Price \$3.50

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D D S F A C D Associate Professor of Prosthetic Dentistry
New York University College of Dentistry Formerly Clinical Pro-
fessor of Oral Diagnosis New York University College of Dentistry
Diplomate of the Board of Prosthodontics Attending in Charge of
Denture Prosthesis New York Polyclinic Medical School and Hos-
pital Associate Attending in Charge of Denture Prosthesis Beth
Israel Hospital Consulting Prosthodontist Downtown Hospital and
Two Contributors Enlarged second edition 501 pages 218 illus-
trations Dental Items of Interest Publishing Co Inc Brooklyn N Y
1954 Price \$9 50

THE DIGITAL CIRCULATION by Milton Mendlowitz M D F A C P
Associate Attending Physician Mount Sinai Hospital Research Fellow
Columbia University Division of Goldwater Memorial Hospital New
York N Y 182 pages illustrated Grune & Stratton Inc New York
N Y 1954 Price \$6 75

STUDYING AND LEARNING by Max Meenes Professor and Head Department
of Psychology Howard University Doubleday Papers in Psychology
DPP 9 Consulting Editor Eugene L Hartley Professor of Psychology
The City College New York N Y 68 pages Doubleday & Co Inc
Garden City N Y 1954 Price \$0 95

RADIOLOGY for Medical Students by Fred Jenn r Hodges M D Professor
and Chairman Department of Radiology University of Michigan
Isadore Lampe M D Professor Department of Radiology University
of Michigan and John Floyd Holt M D Professor Department of
Radiology University of Michigan 2d edition 439 pages illustrated
The Year Book Publishers Inc Chicago Ill 1954 Price \$8

THE GRAPHOMOTOR PROJECTION TECHNIQUE Clinical Use and Stand-
ardization by Samuel B Kutash Ph D Chief Clinical Psychology
Section Veterans Administration Hospital East Orange N J Lecturer
in Psychotherapy Division of Graduate Studies Brooklyn College and
Raymond H Gebl M D Psychiatric Consultant Newark Regional
Office Mental Hygiene Clinic Veterans Administration Monclair
and Elizabeth Family and Children's Agencies Practicing Psycho-
analyst New York N J American Lecture Series Publication Number
218 A Monograph in The Bannerstone Division of American Lectures
in Psychology Edited by Molly Harroue Ph D Research and Con-
sulting Psychologist New York N Y 133 pages illustrated Charles
C Thomas Publisher Springfield Ill 1954 Price \$3 75

ENCYCLOPEDIA OF CHILD CARE AND GUIDANCE edited by Sidonie
Matsen Gruenberg Frances Ullmann DeArmand Managing Editor and
Paula Rush Evans Associate Editor 1016 pages illustrated Double-
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NONTUBERCULOUS DISEASES OF THE CHEST Sponsored by the American
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Editorial Committee Seymour M Farber M D Alvin E Greer M D
Charles M Hendricks M D Minas Joannides M D J Arthur Myers
M D George G Ornstein M D and J Whitrop Pabody M D
1152 pages 280 illustrations Charles C Thomas Publisher Springfield
Ill 1954 Price \$18 75

**DIAGNOSIS AND TREATMENT OF THE ACUTE PHASE OF POLIOMYELITIS
AND ITS COMPLICATIONS** edited by Albert G Bouer M D 250
pages 64 figures The Williams & Wilkins Co Baltimore Md 1954
Price \$6 50

THE VOICE OF NEUROSIS by P l J Mos M D A ta t Cl l
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Fleming A, Young M Y, Suchet J, and Rowe A J F: Penicillin content of blood serum after various doses of penicillin by various routes. *Lancet* 621-624, Nov. 11, 1944.

Cabot R C: Pernicious and secondary anemia, chlorosis, and leukemia. In Oler W (editor): *Modern Medicine*, 31 edition. Lea & Febiger, Philadelphia, Pa., 1949, Vol. pp. 33-100.

FIGURES AND TABLES

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